MIXTEC FOODWAYS IN ACHIUTLA: CONTINUITY THROUGH TIME. A PALEOETHNOBOTANICAL STUDY COMPARING THE POSTCLASSIC AND EARLY COLONIAL DIET

MIXTEC FOODWAYS IN ACHIUTLA: CONTINUITY THROUGH TIME. A PALEOETHNOBOTANICAL STUDY COMPARING THE POSTCLASSIC AND EARLY COLONIAL DIET

By ÉLOI BÉRUBÉ, B.A.

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AUTHOR:	Éloi Bérubé
SUPERVISOR:	Dr. Shanti Morell-Hart
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Abstract

Numerous historical reports written by Spaniards in the Americas during the Early Colonial Period describe public life. However, less is known about quotidian lives during this period. In the Mexican state of Oaxaca, a region encompassing dozens of cultural groups, little is known about the everyday life of Mixtecs and how they reacted towards the newly established Spanish authority in their households. When they arrived at Achiutla, one of the biggest religious centres of ancient Oaxaca (Byland 2008), the Spaniards imposed their power on the public sphere, using religion and economy amongst others (Terraciano 2001:294, 340). My objective is to study the Mixtecs' reaction to the arrival of Spaniards in the region by using paleoethnobotany to study foodways and how Achiutla's inhabitants negotiated the arrival of new food items and to what level they accepted, incorporated, and resisted them.

This study presents the traditional Mixtec and Spanish foodways and the important role they played in their beliefs, traditions, and identities. I present elements supporting the claim that certain Spaniards might have tried to modify Indigenous foodways in the Americas, while others believed it was preferable for Spaniards and Indigenous people to eat different foods. This study also presents other results obtained in Colonial foodways studies made in the Americas and in the *Mixteca Alta* region.

This study includes the analysis of 27 paleoethnobotanical samples, 22 of them being macrobotanical remains obtained from light fractions and 5 of them coming from microbotanical residues extracted from artifacts. All these samples were collected by

Jamie Forde in 2013 at San Miguel Achiutla in the course of the PASMA archaeological project and come mainly from two terraces (10 and 13) likely occupied by Mixtec nobility. By combining samples coming from the Postclassic and the Early Colonial Periods, this study establishes the Mixtec diet prior to the arrival of Europeans in the region, enabling a better comparison between the two. This study supports the idea that the Mixtec diet likely remained the same at Terraces 10 and 13 during the Postclassic and the Early Colonial Periods. Two genera dominate the paleoethnobotanical assemblage: *Chenopodium* sp. (*pazote*, *apazote*) and *Amaranthus* sp. (*huisquelite* or *quelite*), the presence of which demonstrates continuity through times. I assess different scenarios that might explain the absence of European introduced plant species at Achiutla, cautiously presenting a hypothesis linked to Mixtec colonial resistance.

Résumé

De nombreuses sources historiques écrites par des Espagnols en Amérique durant l'Époque coloniale ancienne décrivent la vie publique dans les colonies. Par contre, nous en savons moins à propos de la vie quotidienne lors de cette période. Dans l'État mexicain d'Oaxaca, une région englobant des douzaines de groupes culturels, nous savons peu de choses à propos de la vie de tous les jours des Mixtèques et de leurs réactions face au colonisateur espagnol. En arrivant à Achiutla, un des plus grands centres religieux d'Oaxaca (Byland 2008), les Espagnols ont imposé leur pouvoir sur la sphère publique, notamment par le biais de la religion et de l'économie (Terraciano 2001 : 294, 340). Mon objectif est d'étudier la réaction des Mixtèques à l'arrivée des Espagnols dans la région en utilisant l'archéobotanique pour explorer leur alimentation et comprendre comment les habitants d'Achiutla ont négocié l'arrivée de nouveaux aliments et jusqu'à quel niveau ils les ont acceptés, incorporés ou résistés.

Cette étude présente les alimentations traditionnelles mixtèques et espagnoles et l'important rôle qu'elles ont joué dans les croyances, les traditions et les questions d'identité. Je présente des éléments qui supportent l'idée que certains Espagnols aient pu tenter de modifier l'alimentation des Autochtones dans les Amériques, alors que d'autres croyaient qu'il était préférable que les Espagnols et les Autochtones ne mangent pas les mêmes aliments. Cette étude présente également d'autres résultats de recherches sur l'alimentation lors de l'Époque coloniale dans les Amériques et la région de la *Mixteca Alta*.

Cette étude inclue l'analyse de 27 échantillons archéobotaniques, 22 provenant de restes macrobotaniques obtenus à partir de fractions légères et 5 autres provenant de résidus microbotaniques prélevés à partir d'artefacts. Tous ces échantillons ont été collectés par M. Jamie Forde en 2013 à San Miguel Achiutla lors du projet archéologique PASMA et proviennent principalement de deux terrasses (10 et 13) probablement occupées par la noblesse mixtèque. En combinant des échantillons provenant du Postclassique récent et de l'Époque coloniale ancienne, cette étude établit la diète mixtèque avant l'arrivée des Européens dans la région, permettant une meilleure comparaison entre les deux périodes. Cette étude supporte l'idée que la diète Mixtèque serait restée la même aux Terrasses 10 et 13 durant le Postclassique et l'Époque coloniale. Deux genres dominent l'assemblage archéobotanique : *Chenopodium* sp. (*pazote, apazote*) et *Amaranthus* sp. (*huisquelite, quelite*), leur présence démontrant une continuité à travers le temps. J'évalue différents scénarios qui pourraient expliquer l'absence de plantes d'origines européennes à Achiutla, présentant avec prudence une hypothèse liée à la résistance coloniale mixtèque.

Resumen

Numerosos textos históricos escritos por Españoles en las Américas durante el período Colonial antiguo describen la vida pública. Sin embargo, se sabe menos sobre las vidas cotidianas durante este período. En el estado mexicano de Oaxaca, una región que abarca docenas de grupos culturales, se sabe poco sobre la vida cotidiana de los Mixtecos y cómo reaccionaron ante la autoridad española recién establecida. Cuando llegaron a Achiutla, uno de los mayores centros religiosos de la antigua Oaxaca (Byland 2008), los Españoles impusieron su poder a la esfera pública, utilizando la religión y la economía, entre otros (Terraciano 2001: 294, 340). Mi objetivo es estudiar la reacción de los Mixtecos ante la llegada de los Españoles en la región usando paleoetnobotánica para estudiar los alimentos y cómo los habitantes de Achiutla negociaron la llegada de nuevos alimentos y hasta qué nivel los aceptaron, incorporaron y resistieron.

Este estudio presenta los alimentos mixtecos y españoles tradicionales y el importante papel que desempeñaron en sus creencias, tradiciones e identidades. Presento elementos que apoyan la afirmación de que algunos Españoles pudieron haber intentado modificar los alimentos indígenas en las Américas, mientras que otros creían que era preferible que los Españoles y los Indígenas coman diferentes alimentos. Este estudio también presenta otros resultados obtenidos en estudios de alimentos durante el período colonial realizados en las Américas y en la región de la *Mixteca Alta*.

Este estudio incluye la análisis de 27 muestras paleoetnobotánicas, 22 de ellas siendo restos macrobotánicos obtenidos a partir de fracciones ligeras y 5 de ellos procedentes de residuos microbotánicos extraídos de artefactos. Todas estas muestras fueron recogidas por Jamie Forde en 2013 en San Miguel Achiutla en el curso del proyecto arqueológico PASMA y provienen principalmente de dos terrazas (10 y 13) probablemente ocupadas por la nobleza mixteca. Mediante la combinación de muestras procedentes de los períodos Postclásico y Colonial antiguo, este estudio establece la dieta mixteca antes de la llegada de los Europeos a la región, permitiendo una mejor comparación entre los dos. Este estudio apoya la idea de que la dieta mixteca probablemente permaneció igual en las Terrazas 10 y 13 durante el Postclásico y el periodo Colonial antiguo. Dos géneros dominan el conjunto paleoetnobotánico: *Chenopodium* sp. (*pazote, apazote*) y *Amaranthus* sp. (*huisquelite, quelite*), cuya presencia demuestra continuidad a través de los tiempos. Evaluo diferentes escenarios que podrían explicar la ausencia de especies de plantas introducidas de Europa en Achiutla, presentando cautelosamente una hipótesis vinculada a la resistencia colonial mixteca.

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Chapter 1: Introduction

Numerous historical reports written by Spaniards in the Americas during the Early Colonial Period describe public life. However, less is known about quotidian lives during this period. In the Mexican state of Oaxaca, a region encompassing dozens of cultural groups, little is known about the everyday life of Mixtecs and how they reacted in their households towards the newly established Spanish authority. When they arrived at Achiutla, one of the biggest religious centres of ancient Oaxaca (Byland 2008), the Spaniards imposed their power on the public sphere, using religion and economy amongst others (Terraciano 2001:294, 340). However, Colonial Spanish texts do not allow us to determine how the Mixtecs behaved in their households and in their daily lives. As such, this study will focus on the Mixtecs of Achiutla, Oaxaca, Mexico, during the Early Spanish Colonial Period (1521–1600 AD) in terms of their everyday life.

The term “Mixtec” comes from the Náhuatl and means “Cloud-people” (De Avila 2010:1). During the Postclassic Period, Mixtecs lived in “semi-autonomous polities” (Forde 2015:5), or city-states, later called *cacicazgos*. Archaeologically, their presence is associated with “powerful rulers, elaborate architecture”, glyphs, codices, and “sophisticated agricultural technologies” (Joyce 2010:xiii). They occupied a territory extending on nearly 45,000 square kilometres in the modern states of Oaxaca, Puebla, and Guerrero (De Avila 2010:1; Forde 2015:49). The *Mixteca* can be divided into three regions: the *Mixteca Alta*, the *Mixteca Baja*, and the *Mixteca de la Costa* (Figure 1.1). The *Mixteca Alta* was the most populated region and played an important political and cultural role since the Formative Period (1900 BC—400 AD) (De Avila 2010:1). The *Mixteca Alta* is for the most part above 1600 metres of altitude and includes many important polities, such as Teposcolula, Tlaxiaco, Nochixtlán, and the focus of this research, Achiutla. The *Mixteca Baja* is located at around 1600 metres, while the *Mixteca de la Costa*, located along the coast, is below 800 metres (De Avila 2010:1). The coast and the mountains greatly influence the climate of the *Mixteca*, creating different environments, ranging from humid sites at the bottom of mountains, to arid and freezing areas in higher altitude (De Avila 2010:6).

Figure 1.1: Map of the *Mixteca* (Forde 2017a:491)

I believe The Mixtecs are an ideal case study to address how they negotiated the arrival of Spaniards into their life and how they reacted in their households to the pressures exerted on them. As they were part of a semi-autonomous city-state political system, it is possible to examine at the same site how the inhabitants behaved following the Conquest, from the commoners up to the elite members. Colonial Mexico also provides the opportunity to study cultures that were faced with rapid and profound changes in their material culture (Cummins 2002:199). Achiutla is also an ideal archaeological site to study the local Mixtec reaction towards the newly established Spaniards, as it was located at the periphery of New Spain (Forde 2015:8; 2017a). Far from the colonial centre, the Spaniards had less control at Achiutla and had to rely on the Mixtec co-operation, which must have affected the dynamics in place at the time. The fact that Aztecs conquered Achiutla about a century before the Spanish Conquest also provides an interesting opportunity to investigate how the Mixtecs negotiated the arrival of a new power, knowing what happened recently and how their ancestors were affected by it.

My primary objective is to study the Mixtecs' reaction to the arrival of Spaniards by analyzing household foodways. Investigating what people ate provides promising insight into social dynamics, including the formation and modification of identities, and cultural transformations. Foodways are directly linked with the broader patterns of consumption (Dietler 1998:288). Effectively, studying the consumption of goods leads to an understanding of how objects were produced, acquired, and especially, used. By looking at artifact consumption, archaeologists are able to understand how people "negotiate, accept, and resist" other cultural elements (Mullins 2011:133). It is the same with food: by focusing on what people ate, we are not only looking at what they ingested in order to survive, but also at the meanings behind this act and its roots in different contexts, whether social, political, or cultural.

Archaeology and the study of consumption patterns is a great way to examine continuity in Indigenous cultures and identities, as it gives us the opportunity to study daily activities and also consider long-term phenomena (Fox 2002:2; Dietler 2006:218; Hastorf and Weismantel 2007:308; Panich 2013:105;). We produce or acquire things that we use in order to express ourselves or whom we would like to be (Mullins 2011:135). Consumption plays the role of an identity maker both at the individual and at the collective levels (Mullins 2011:135). Once again, I argue this could be said about foodways. We choose what we are eating for various reasons: economic (a food item is preferred because it is easily acquired), personal preferences (individuals have different tastes and food allergies), or even political ones (an individual or a group of people decide to boycott the products of a company that does not respect their values). Foodways are also closely tied to commensality and security, as individuals often share meals with close relatives (Fox 2002:1). When possible, we choose the foods we consume in order to express ourselves, and eating becomes a way to build our identity.

By studying shifts in foodways between the Postclassic Period (900–1521 AD) and the Early Colonial Period (1521–1600), I assess to what extent the Mixtecs resisted, accepted or negotiated Spanish cultural elements in their own daily and ritual lifeways. To do so, I compare the foods consumed during the Early Colonial Period at Achiutla to those consumed before Spanish Contact. Food residues were studied using paleoethnobotanical techniques, and thus my study is focused on plant foods and plant resources. Specifically, the identification of macrobotanical remains (seeds from sediments) and microbotanical residues (phytoliths and starch grains recovered from artifacts) shed light on what species were consumed. I identify the provenience of the crops that were eaten after the arrival of Spaniards, in order to assess if they were new European ones (wheat, barley, pears, etc.). (Trigg 2004:228, 231; Earle 2012:71, 159–160) or if they were part of the traditional Mixtec foodways (maize, squash, beans, etc.) (Fussell 1992). Through this comparison, I was able to assess the continuities and differences in Mixtec foodways after being exposed to Spanish foods. As Dietler argued in 1998, the study of food consumption at the early stage of a cultural encounter enables archaeologists to explore the process leading to the establishment of a cultural relationship that is going to influence the dynamics between the groups, making it an interesting subject to investigate.

The four main objectives of this research are as follows:

Objective 1: Establish the foodways of Mixtec people in Achiutla prior to the Spanish Contact. To do so, I examine artifacts and sediment samples associated with the Postclassic Period recovered in one household at San Miguel Achiutla. This allows me to understand the general foodways in place at Achiutla before the arrival of new foods in the region. By analyzing the archaeological data obtained, comparing and combining it with the archaeological and historical knowledge of the region, I was able to build a general understanding of the plants usually consumed at Achiutla and the *Mixteca Alta*, which enables me to list certain traditional plants I could expect to find in the later time periods and quickly identify introduced plant species.

Objective 2: Determine to what extent Mixtec people incorporated new foodways into their daily and ritual regimes during the Early Colonial Period. To do so, I compare the food residues recovered from artifacts and sediment samples associated with the Early Colonial Period occupation of two households. As the samples come from the same households as the ones from the Late Postclassic Period, I am able to compare what the people living in the same space ate before the Colonial encounter and which foods later made their appearance in the Mixtec diet. To determine if the new foods were likely incorporated in Mixtec foodways freely or by force, I consider the number of new foods identified, their quantities, their presence in other regional archaeological sites, their use in contemporary Mixtec culinary tradition, and their presence in historical sources.

Objective 3: Determine to what extent Mixtec people abandoned prior foodways. The abandonment of a Postclassic food items can be linked with different scenarios, including the decreases in availability of the resource, an economic choice, a change in taste, or a change caused by force. To address this question, I compare the plants identified during the Postclassic Period and follow their presence in the later time periods. By looking at four different relative time periods (Postclassic, Postclassic/Colonial, Colonial, and Colonial/Later) it enables me to track at four different stages the use of certain plants, highlighting the decrease and disappearance of different plants from the archaeological record.

Objective 4: Building from the prior two objectives, determine to what extent Mixtec people upheld traditions in the face of indirect influence and direct application of power. By comparing the Mixtec foodways during the Early Colonial Period and the Late Postclassic Period, it was possible to identify which foods appeared and disappeared. By taking all of this into account, I was able to address persistence in Mixtec foodways in the Early Colonial period. This allows me to assess to what degree Mixtec people resisted Spanish influence or appropriated Spanish foodways during the Early Colonial Period.

Theories of Contact and Colonialism

In order to contextualize my research in the *Mixteca Alta,* it is important to consider various approaches to Contact and Colonial studies, and especially transformations of the Colonial theories over time. Archaeologists have radically changed their vision of Colonial sites and the agency of Indigenous people. Here, I focus on acculturation theory, followed by a description of the transculturation model. Then, I give an overview of archaeological theories of hybridity and resistance. The changes in these theoretical perspectives over time have implications for the kinds of questions asked by archaeologists and the kinds of interpretations developed.

One of the earliest anthropological theories that addressed European expansion was acculturation (Ortiz 1947:97). In this model, it was believed that pre-Hispanic societies would include European objects and customs in their own culture for utilitarian reasons (Forde 2015:21). This tends to place European objects as being of a higher utilitarian and functional value (Forde 2017a:505) and diminishes the culture and values of Indigenous societies. By considering the European technology (and possibly even Europeans themselves) as more refined, more developed (Forde 2017a:505), it is highly problematic, as it can be linked with highly criticized ideas, such as ethnocentrism (Forde 2017a:506) or even racism, by placing a culture on top of the other and leaving behind cultural relativism and other important anthropological concepts.

The basic acculturation model has since been challenged by the development of many other archaeological and anthropological theories (Cusick 1998; Deagan 1998; Silliman 2009; Forde 2017a). It is now possible to study changes and continuities in Indigenous material culture and in Spanish culture while giving more importance to the people behind these actions.

Transculturation

One of the first theories developed to "substitute acculturation", transculturation comes from the Cuban Fernando Ortíz (1995 [1947]:97). According to this scholar (1995 [1947]:98), Cuban culture is constructed from "extremely complex transmutations of culture". In other words, the Cuban culture was modified through time and through contact with other cultural groups. During these encounters, the different cultures all borrowed certain elements and incorporated them into their own culture, creating new identities in their wake. To support his claim, Ortíz uses different examples from Cuba, including the passage from Paleolithic to Neolithic, colonization, and even post-Contact immigration (Ortíz 1995 [1947]:98). According to him, the Cuban identity is combining elements from the Indigenous groups, the Spaniards, and the immigration flow, first composed of enslaved people, and later replaced by many cultural groups from Asia, Africa, Europe, and the Americas. This means that every cultural encounter transformed the Cuban identity and slowly transformed the inhabitants of Cuba into the Cubans known today. This means that, in order to understand the contemporary Mixtec culture, we have to study its development from the very beginnings, their relation with other Indigenous groups, and investigate carefully every cultural group with whom they interacted. The work of Ortíz is considered to have provided new dynamism in the questions surrounding other cultures and identities (Funari 2014; Deagan 2015:27).

I borrow from transculturation the idea that cultures are always moving through time, and are dynamic (Ortiz 1995 [1947]:98–99). Rather than seeing cultures as static entities, Ortiz believed that cultures were fluid and always changing, at moments slowly and at other times very rapidly. For example, he explains that the passage from husbandry to agriculture took a long time, while the arrival of the Spaniards led quickly to the development of a capitalist industry, based on the production of tobacco and sugar cane, a process that was even accelerated when the immigrants' flux became more important (Ortiz 1995 [1947]:98–102). Theories of transculturation open the possibility that the Mixtec culture changed from the Formative (1900 BC-400 AD) to the Postclassic (900–1521 AD), through time and with interactions with other cultural groups, such as the Aztecs or the Zapotecs. The Spaniards then emerge as another cultural group with whom they interacted, possibly influencing Mixtec culture. This would also mean that the Mixtecs influenced to a certain extent the Aztec, Zapotec, or Spanish cultures with whom they interacted.

Ortiz and his concept of transculturation created a new way to analyze colonial interactions (Malinowski 1947; Funari 2014; Deagan 2015). However, I distance myself from Ortiz's statement that Indigenous culture disappeared with the arrival of Spaniards

(1995:98). The Colonial Period is a period where many changes can be seen archaeologically (Cummins 2002:199), where many episodes of violence occurred (Pels 1997:170), but numerous Indigenous communities and cultures persisted through time in significant ways (Panich 2013:105). In his research, Cummins (2002) explores how Andean Indigenous people interacted with the Catholicism brought by the Spaniards and transformed it in a way that would not give all the power the Spanish authorities. As he explains, it is possible to observe the power of the Spanish authority through religion, but their objectives "[where] not yet fully achieved" (Cummins 2002:199), as it left place for Indigenous reinterpretations. Panich (2013) encourages researchers to focus on Indigenous persistence through identity, practice, and context, rather than only targeting changes and discontinuities. He believes this will help to get rid of the idea that the Spaniards' arrival led to the disappearance of the traditional Indigenous cultures and communities. According to a survey made in 2005, there are currently 446,000 thousand speakers of Mixtec languages, 322,000 of them living in their ancestral homelands (De Avila 2010:1). According to the *Instituto Nacional de Lenguas Indígenas*, there are currently 81 variants of the Mixtec language, many being unintelligible from the others (De Avila 2010:1), demonstrating that the Mixtec culture is still present and dynamic in Oaxaca and throughout the *Mixteca*.

Hybridity

Homi Bhabha (1994; 1996) developed the concept of hybridity, which greatly influenced anthropology. By giving a central place to agency (Liebmann 2013:41, 43; Pappa 2013:36; Silliman 2015:281), it has served as a critique of theories such as acculturation and assimilation, which were centred on the ways Indigenous cultures were transformed and Europeanized (Silliman 2015:281). Bhabha (1996:54) believed hybridity was a way to provide Indigenous communities with a "discourse". It can be used in a way to explore the "limits of colonial dominance", when the colonized people transform colonial cultural traits to provide them with new meanings (Liebmann 2013:41). Pappa (2013:44) also believes that hybridity encourages and provides opportunities for archaeologists to study the "hidden and the socially oppressed", by exploring their relation towards other cultures' elements and how they negotiated and transformed them to fit their beliefs. Silliman (2015) reflects on the definitions of hybridity, what makes an artefact hybrid, and for how long can we consider it to be hybrid, while also encouraging to consider hybridity in the long term and not only in short periods of time, the latter limiting the possibility to analyze all the processes linked with the creation of a new cultural trait.

Hybridity is a large term with many definitions. The word itself comes from biology, usually referring to mixing genetic lines or species (Card 2013:1). Although based on the idea of mixing, the anthropological and social sciences definition of hybridity has nothing to do with genetics (Dean and Leibsohn 2003:9; Stewart 2011: 50; Bader 2013:261; Card 2013:1). Hybridity in anthropology is rather used when studying colonialism and cultural encounters, ranging from the Roman expansion (Card 2013) to Spanish colonization (Cordell 2013), without forgetting immigration (Stewart 2011:54–55). It focuses on cultural elements that become mixed through cultural encounters, trades, and other instances, where different cultures interact with each other (Eriksen

2007:172; Clack 2011:228; Stewart 2011:50; Liebmann 2015:319). Hybridity acknowledges the agency of the cultural groups involved in these dynamics and also provides the opportunity to address questions of resistance when needed (Liebmann 2013:43).

In material culture, hybridity is represented by an object, which is categorized using existing types that are linked with different cultures (Van Dommelen 2005:118; Bader 2013:261; Hitchcock and Maerir 2013:57; Liebmann 2015:320). To explore hybridity, researchers have to examine both "stylistic" and "technological" components of material culture (Card 2013:1). To determine if an object is a hybrid, archaeologists need to know the context behind it, how the artefact was used and by whom (Silliman 2009:215). For example, Liebmann (2013) studied a chalice recovered at the Jemez pueblo of Giusewa. This chalice, a symbolic object of Catholicism, was made following the "Indigenous Puebloan pottery style", including traditional Puebloan iconography. It was found in the ancient convent, built and occupied for a very short period of time (1598–1601). As it was the first attempt to establish a Franciscan mission at Giusewa, Liebmann (2013:34–35) believes that the chalice was likely "manufactured, used, and discarded" during those four years. Liebmann (2013:37) explains that, using the acculturation model, the presence of a chalice combining the traditional Puebloan crafting would demonstrate that Jemez Puebloans accepted the new religion, without even considering the fact that this artifact was likely crafted for the use of a Spanish friar and not necessarily by the Mixtec population. Using hybridity, Liebmann (2013:41–42) explains two new ideas that emerged from the presence of this chalice combining the

Spanish and Puebloans traditions. According to Liebmann, it is possible that certain Jemez considered this artifact as a demonstration of repression and loss of freedom, being forced to associate their traditional pre-Hispanic material culture with the Catholic religion. Liebmann believes that others might have seen this as a way to gain power over the friar, changing the meaning of the chalice with the inclusion of the Puebloan iconography, "forcing the Spaniard to bend to the will of the Jemez". As Dean and Leibsohn (2003:6) put it, in studying hybridity, "[both] visibility and invisibility" are important, meaning that we have to take into account the symbolic meanings and traditions that are not visible, but that can be inferred from the analysis of material culture.

Because hybridity tries to identify cultural traits or objects that are located between two cultures, it can easily be linked with the concept of an idealized "racial purity" (Eriksen 1993:134; Stewart 2011:52; Stockhammer 2012a:1–2; Pappa 2013:32, 35). This is not the aim of hybridity as used by archaeologists. As Dean and Leibsohn (2003:5) state, cultures "are collective, they are inherently heterogeneous". Cultures have been and still are constantly in contact, creating dynamic changes (Bhabha 1994:94), and thus all cultures are mixed cultures to a certain point. Therefore, when archaeologists look at hybridity, they create arbitrary settings in order to decide what belongs to a culture and what does not (i.e. ceramic style, symbolic use of the objet, archaeological context, etc.). However, we have to understand that these settings are related to our paradigms, our understanding and knowledge of past societies (Liebmann 2015:320–321). Cultures are always moving, always changing, and thus when studying cultural interactions and colonialism, researchers have to define certain general cultural traits in order to examine the negotiation, and sometimes the incorporation and transformation, of certain cultural traits. This poses difficulties, as researchers might misunderstand the meaning behind certain objects and be misled in their interpretations. Therefore, archaeologists have to be very cautious, as identifying the meaning and ideas linked to objects from past societies is extremely difficult.

When considering the European Colonial Period in the Americas, hybridity acknowledges that the European expansion had great consequences on Indigenous groups (Deagan 1990:297–298). These consequences have taken many forms, including episodes of violence, severe cultural restrictions, eradication of key cultural traditions, and disease epidemics that swept aside millions of Indigenous people. However, hybridity also acknowledges that European colonization led to the development of a new cultural identity, involving a complex form of European, African, and American cultures (Deagan 1990:297–298).

However, as Liebmann (2015:325) and Silliman (2009:214) explain, archaeology tends to focus on hybridity of Indigenous cultures way more than European cultures. This is a problem, as Indigenous rights and public perception are often linked with concepts of degree of authenticity of Indigenous culture and to what extent culture changed through time (Silliman 2009:213). As Silliman (2009:214) writes, everybody knows maize comes from the Americas, but nobody ever says the inclusion of maize in the European diet made them less European. In order to survive, cultures have "to change *and* remain the same" (Silliman 2009:226). Including other cultures' traditions comes with negotiation and reinterpretations and is not a simple acculturation process. Italy is famously known for its pizzas and pasta made with tomato sauce, Irish food heritage is strongly tied to potatoes, and lime and cilantro will often accompany the traditional Oaxacan *moles* or *tlayudas*. Tomatoes and potatoes originally came from the Americas, while cilantro and limes came from Europe. These regions and cultures appropriated plant ingredients that were not autochthonous, and used them in novel ways, reinventing and creating wonderful plates that are now part of their gastronomic heritage. In each case, plant foods became something completely different by being reinterpreted and transformed by other cultural groups who had different backgrounds, beliefs, and concepts. With food, as with any other material culture, the context and the way objects are used are more important than the objects themselves (Silliman 2009:215).

Although scholars working in the Americas mostly study hybridity during the Colonial Period, it is also visible both before and after Colonial time periods (Harrison-Buck et al. 2013). After all, hybridity focuses on the study of interactions between different cultural groups, a process that is always ongoing. Hybridity is an "unresolved and ongoing" process (Liebmann 2015:323). However, this raises questions, such as: How long can an object stay hybrid (Liebmann 2015:322; Silliman 2015:283)? If cultures are always fluctuating and changing, what is hybrid and what is not (Silliman 2015:283)? As mentioned earlier, archaeologists arbitrarily decide what is hybrid and what is not, what should be considered being part of a certain culture and what should not (Liebmann 2015:320–321). The time restraints are also problematic in the study of hybridity. In order to understand and examine hybridity, the time limits need to be strict

(Pappa 2013:37). We have to grasp the moment where a cultural component is consciously included and incorporated, before it became unconscious after the rise of another generation who always saw it that way (Pappa 2013:37). Borrowing from Bourdieu's concept (1976:100), our goal is to find objects while they are still part of the *hétérodoxie*, before they become part of the *doxa*, when they become considered *comme allant de soi* (as normal).

Hybridity occurs over a short time, but it needs to be incorporated in a broader picture, a bigger time frame, in order to provide us a way to connect certain events to cultures and to still be able to explore these impacts on today's societies (Silliman 2015:288). The incorporation and transformation of a cultural trait did not happen at once, and in the same way, for everyone. This is why we have to look at it at the level of the individual or household (Stockhammer 2012a:2–3). This is the best way to see if and how a new cultural element made its way into a new context.

Bhabha's original definition of hybridity has been politicized (Pappa 2013:33). It is now tied with subversion and resistance (Pappa 2013:33). In archaeology, there is a debate whether the use of hybridity should necessarily be linked with resistance (Liebmann 2013:31; Loren 2013:152; Pappa 2013:33; Silliman 2015), or not (Dean and Leibsohn 2003:8; Card 2013). Bhabha believed hybridity could inform us on the "limits of colonial dominance", where objects and cultural components can be reinterpreted by others without the colonial authorities being able to control it (Bhabha 1994:154–156; Liebmann 2013:41). Hybridity therefore has the power to challenge colonial authorities and colonial dominance, which sometimes provides researchers new opportunities to study acts of resistance.

<u>Resistance</u>

Resistance, according to Bhabha (1985:153–155) is more than simply an act of rejection of elite lifeways and domination. It can be the act of changing the meaning of certain cultural traits without the elite being informed or being able to acknowledge this transformation. It means that incorporating certain cultural elements can also be an act of resistance, depending on the motives behind it. Once again, context is the key component in the analysis of resistance. Resistance is often perceived as collective action, but we must not forget that there exist many different groups with divergent opinions and objectives (Hodder 2004:32). Resistance for one person might not be the same for another, and certain artefacts could be argued to be linked with resistance in certain contexts and not in others. Therefore, we must remain cautious in our interpretations of objects and their roles in facilitating or demonstrating resistance.

Resistance can be public and can include actions of refusal, fighting, and protest (Hollander and Einwohner 2004:534). It can also be more passive (Scott 1985, 1990; Hill 1991:294). James Scott (1990:2–5) developed the term *public transcript* to describe acts of resistance that take place on the public stage and directly challenge authority. While performing public transcripts, individuals risk being identified by the authorities and punished. For acts of resistance where the message is hidden from the authorities and only certain people can truly understand the meaning of it, Scott (1990:2–5) uses the term *hidden transcript*. It is more difficult to detect, and can be safer to perform. In his 1985 publication, Scott explores how peasants can resist authority, both on the public and private spheres. In archaeology, Mobley-Tanaka (2002:77) studied the concept of hidden transcript. In her research on ceramics, she established that, before the arrival of Europeans, Pueblo artists drew dragonflies, stars, and birds in patterns that looked like the Christian cross (Mobley-Tanaka 2002:88). When the Spaniards arrived, Puebloans continued using the same pictography, reinforcing their ritual beliefs without the Spaniards noticing it, because they thought these illustrations represented Christian crosses. By doing so, Pueblo people were able to pursue their traditions in plain sight without any opposition, thereby resisting European power and the will to convert them to Catholicism. This type of resistance played an important role in the household, as it was one of the ways to preserve the Pueblo identity and culture in the everyday life. I would argue that these patterns on ceramics also played a role in foodways, as some of those dishes were probably were used during meals.

Many scholars agree that the concept of resistance has been overused in archaeology and anthropology (Hodder 1984; Brown 1996; Given 2004; Beck et al. 2010; Deagan 2010). By interpreting every interaction between Europeans and Indigenous groups as acts of resistance, we lose our ability to fully comprehend and examine variability (Beck et al. 2010:27), as well as the very severe impacts that European militaries, trade goods, and diseases had on Indigenous peoples. We have to go back to the motivations behind acts and be careful when we identify acts of "intentional resistance" (Given 2004:12; Hodder 2004:32). In order to do so, the best way is to combine different sources of information (archaeological, historical, ethno-historical data, etc.) in order to obtain an understanding of the dynamics in place at that time and ultimately identify the presence or absence of resistance behaviours.

My research addresses each of these dimensions in a number of ways. By considering Mixtec and Spanish cultures as dynamic, I believe they were both transformed to a certain extent during the Colonial encounter. This means that, for a short period of time, certain cultural elements got reinterpreted, leading to the development of a hybrid form, before being accepted *comme allant de soi*, port of the *doxa*. By examining the use of plants during the Early Colonial Period, I am able to concentrate my efforts on a short period of time (1521–1600 AD), where I believe to be able to identify possible hybrid use of plants. However, the context and the use of plants are crucial to understand in the interpretation and determination of hybrid forms and of resistance behaviours. I focus on foodways, as it is a great way to be able to study households' dynamics of the inhabitants of Achiutla. As I will explain later, the fact that the occupants of these two terraces were nobles means they received food as tribute, which informs us not only on the food consumed in the private life, but also about the food produced by other families and given to the occupants of Terraces 10 and 13. Finally, because eating is an everyday activity that is highly tied with identity, it provides an interesting subject to investigate (Fox 2002:2; Dietler 2006:218; Hastorf and Weismantel 2007:308; Panich 2013:105). In the next chapter, I begin with an overview of Mixtec lifeways prior to the arrival of Spaniards, how they were transformed during the Early Colonial Period, and how they persisted, in some cases into contemporary times.

Thesis Organization

In order to address the four objectives mentioned earlier, my research is organized into seven chapters. In Chapter 2, I provide an overview of the Mixtec culture prior to the arrival of Spaniards in the region. I start by briefly explaining the consequences of the end of the Classic Period and the start of the Postclassic. Then, I provide a description of the *cacicazgo* system, based on city-states. I focus on the hierarchical system in place in the *Mixteca*, before describing the Mixtec economic system mostly based on agriculture and craft production. Finally, I talk about the Mixtec religious beliefs and the important role played by Achiutla during this time period. I will briefly mention the Aztec Conquest of the region and its impacts on Mixtec people, before talking about the Spanish colonization process in the same region. I explain how the Spaniards transformed the traditional Mixtec political, economic, and religious systems, and how the people of Achiutla reacted to these changes.

In Chapter 3, I focus on Mixtec and Spanish foodways during the Postclassic and the Early Colonial Periods. I begin by describing the pre-Columbian Mixtec foodways, and the importance of maize in their culture. Then, I briefly explore the Aztec foodways before explaining the traditional Spanish diet and the key role of wheat in their foodways. I explain the importance for the *conquistadores* of maintaining an Iberic diet and the different motivations that might have encouraged the Spanish settlers to modify Indigenous foodways throughout the Americas. I then present a select overview of archaeological and historical knowledge scholarship on Indigenous foodways during the Early Colonial Period throughout the Americas. I finish by focusing on the few results obtained from other archaeological sites of the *Mixteca*.

Chapter 4 describes the selection of samples in the field and methodology I followed during the paleoethnobotanical analysis. I start by explaining how the archaeological samples were selected and collected at San Miguel Achiutla and sent to McMaster University. Samples were collected from two terraces (10 and 13), both likely occupied by nobles, one family being probably wealthier than the other, providing the opportunity to observe the foodways of two highly ranked families with different levels of prestige. I continue by explaining the steps I followed in the course of the macrobotanical analysis. I follow this chapter by describing how I collected the microbotanical samples from the artifacts, and how I analyzed and identified them in the laboratory. I finish this chapter by addressing general preservation issues that can affect the identification of paleoethnobotanical remains.

Chapter 5 presents the results obtained during this paleoethnobotanical research. The macrobotanical and microbotanical samples come from two terraces that I describe in greater detail, in order to provide the archaeological context behind the results. Then, I present the macrobotanical results of the bulk flotation analyses, followed by the microbotanical results of the artifact residue analyses. I separate these results by provenience (Terrace 13, followed by Terrace 10) and by time periods in each terrace (Postclassic followed by Colonial), in order to facilitate the comparisons between pre-Hispanic and Colonial foodways at San Miguel Achiutla.

In Chapter 6, I present an interpretation of the results from the paleoethnobotanical analyses, incorporating other lines of evidence from the investigations and Colonial documents. In this chapter, I analyze the samples by combining together the ones associated to the same archaeological contexts. I will compare the results obtained from my analyses to the interpretations previously made of the structures and features at Achiutla. As in the earlier chapter, I separate the results by terraces and time periods, before combining them to provide a broader interpretation of the Mixtec foodways and present an overview of continuities and differences in the archaeological assemblages.

Finally, in Chapter 7, I provide a general overview of the research and my interpretations, before returning to the four main objectives of my research. I also address other questions encountered during the research, such as comparing the paleoethnobotanical data with the archaeological hypotheses related to the function of the features and units analyzed. I also include recommendations for future research, to get a better understanding of Mixtec foodways and dynamics at San Miguel Achiutla, and to identify differences in the daily lives between commoners, nobles, and elite members, which could lead to interesting data that could be compared to other archaeological sites of the region and continent.

Chapter 2: Mixtec Lifeways During the Postclassic and Early Colonial Periods

In the *Mixteca Alta* region, and throughout Mesoamerica, the Postclassic Period (900–1521 AD) is defined as a time period during which major city-states were depopulated, some regional populations declined, and many political institutions became less powerful. In contrast, as with other sites in Mesoamerica, during the Postclassic, the Mixtecs developed a powerful political organization. New autonomous polities with strong social organization emerged throughout the Oaxaca Valley (Balkansky et al. 2000:380; Forde 2015:5). During the Postclassic, the Mixtecs also built on previous economic systems and improved crafting and trade routes. Finally, they shifted major religious beliefs and developed new ritualized practices.

When the Spaniards arrived (1521), they imposed many changes on the Mixtecs, such as the *encomienda* system and the *cabildo*. The Mixtecs, for their part, resisted some of these changes publicly, and subverted others in the privacy of their households and the day-to-day. In order to fully understand how the Early Colonial Period (1521-1600) affected Mixtec culture and identity, this chapter will compare the Postclassic Period to the Early Colonial Period by focusing on four main components: the political organization, the social organization, the economic system, and religious beliefs. In this chapter, I will also examine how the Mixtec people of Achiutla reacted to the newly established Spanish authority. As I will demonstrate in this chapter, the people of Achiutla were forced to modify their economic system and the Spanish pressure to convert them to Catholicism was strong. However, they were able to maintain many traditions, including their political structure, relatively intact. At times, they strongly resisted colonial power and found ways to turn it against itself, using the Spanish judiciary system.

Postclassic Lifeways Prior to European Contact

Throughout many regions of Mesoamerica, at the end of the Classic Period, there is evidence of a strong demographic decline, followed by the abandonment of many great cities (Balkansky et al. 2000:368; Aimers 2007; Evans 2013). Societies in Oaxaca did not avoid the same fate, although it is believed the impacts of it were minimal in the *Mixteca Alta* (Gutiérrez Mendoza 2008; Forde 2015:53). Archaeologists throughout Mesoamerica have been able to identify many shifts during this time period, such as a decline of elite power, decreases in the construction of monumental architecture, and modifications in ritual and religious beliefs (Aimers 2007). Faced with these profound changes, many early archaeologists defined the Classic Period as the "Golden Age" of Mesoamerica and the end of this period as the "Collapse." There is still a great debate around the reasons for the dramatic demographic shifts at the end of the Classic Period in Mesoamerica, and my goal is not to explain these here.

Using the term "collapse" would mean the Mixtec culture declined quickly after the Classic Period and even disappeared entirely. On the contrary, the Postclassic Period was a time of resurgence for Mixtec identity, albeit in sometimes new forms. Balkansky and his team (2000:368, 380) were able to identify twice as many sites in the Oaxaca region during the Postclassic Period than during the Classic Period. Of course, this number has to be taken cautiously, as more recent sites tend to be easier to identify archaeologically than their predecessors, due to their higher visibility and the fact that some sites are built over previous ones. After the demographic decline of the Late Classic Period, the population experienced a demographic boost (Spores 1984:48) and the appearance of new cities (*cacicazgos*), such as Achiutla, also known as San Miguel Achiutla (see Figure 2.1).

Achiutla became an important religious polity of the *Mixteca Alta* region. One of the reasons to explain this is the fact that Mixtecs believed that two sacred trees were located at this *cacicazgo,* which were believed to have led to the birth of many ruling ancestors of the *Mixteca Alta* (Forde 2015:6–7). As I will demonstrate in this chapter, although Achiutla was a newly established kingdom, it quickly became famous in the region, and even to the Aztecs. At Achiutla, rather than seeing the Postclassic Period as a mere shadow of the Classic Period, I instead view this time period as a very dynamic period associated with the creation of new identities and strong cultural beliefs.

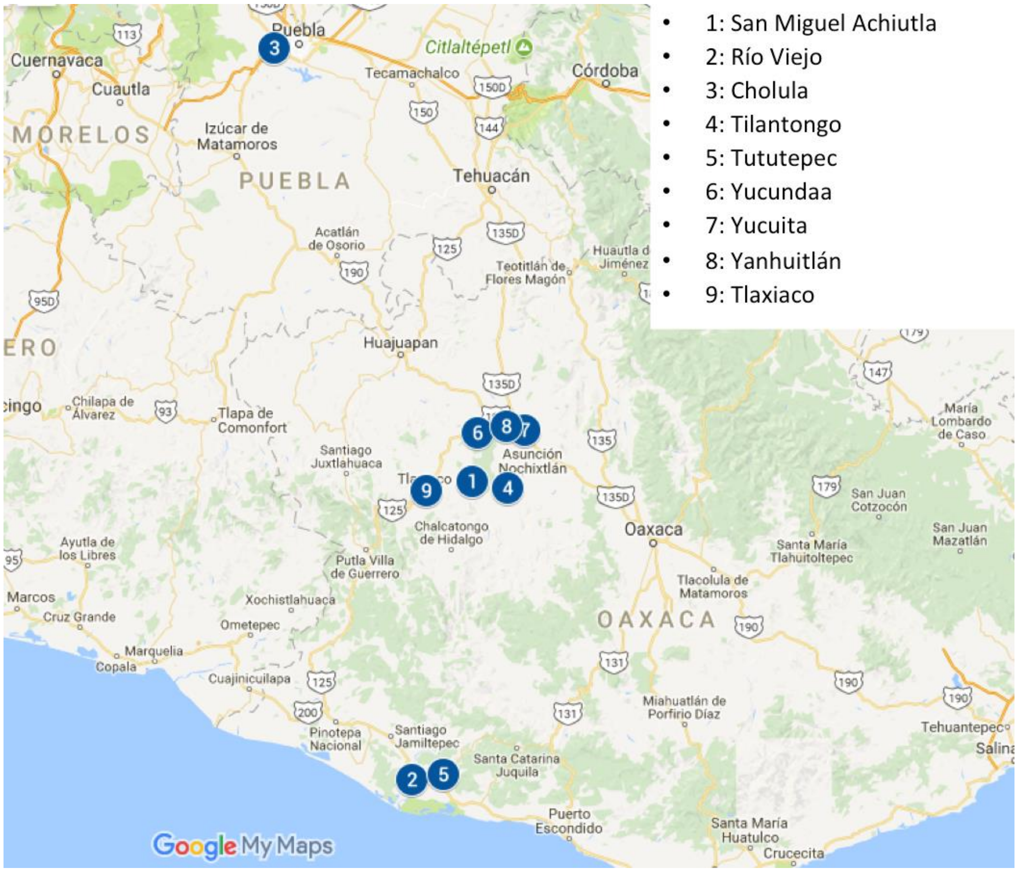


Figure 2.1: Important *cacicazgos* mentioned in this research

The *Cacicazgo* System: How Does It Work?

During the Postclassic Period, the Mixtecs lived in "small, semi-autonomous polities" generally referred to as *cacicazgos*, a Spanish word that could be translated as city-state (Forde 2015:5). This political system probably appeared during the Classic Period (Balkansky et al. 2000:383), but it was not until the Postclassic Period that it spread in the *Mixteca* region (Spores 1984:3–4). In general, 2000 to 10,000 people would have been living in one *cacicazgo*, although some larger ones could have hosted more than 25,000 people (Blomster 2008:22).

Each *cacicazgo* differed from the others, which is particularly visible archaeologically when we observe architecture and tie it to urbanism (Blomster 2008:23–24; Pérez Rodríguez 2013:89). These differences can be explained mainly by the fact that the *cacicazgos* were semi-autonomous. The leaders and the members of the communities could transform their city the way they wanted without having to conform to a broader model. Topography can also explain some of these differences between *cacicazgos*. The *Mixteca Alta* region is composed of deep valleys and high mountains. Depending on the location where the city was built, different obstacles would have constrained the options available to villagers. However, Pérez Rodríguez (2013:85–89) was able to identify certain key components present in the vast majority of the *cacicazgos* that prove helpful when trying to identify if the site studied is a *cacicazgo* or an agricultural settlement. These include particular forms of city and agricultural infrastructure, the presence of a palace, and particular architecture and artifacts related to political and religious institutions. For example, archaeologists found at Yucundaa households of different statuses and roads, demonstrating a certain level of urbanism, with the addition of a monumental sector where they encountered a ballcourt. They found *lama bordo* agricultural terraces and many palaces and plazas, where public and private activities might have occurred, respecting the categories identified by Pérez Rodríguez (2013:87–88).

Achiutla, during the Postclassic Period, covered a linear distance of 4 to 5 km (Balkansky et al. 2000:380). Archaeologists have identified agricultural terraces, a residential area that was "U-shaped," and great platforms that would have served the role of political and religious institutions (Balkansky et al. 2000:380). These elements therefore match the key components of a *cacicazgo* as defined by Pérez Rodríguez (2013). The exact location of the palace remains in question. According to some theories, it might have been located where the colonial convent was erected (Balkansky et al. 2000:381) and therefore razed and/or buried in overburden. Compared to other *cacicazgos,* the architecture of Achiutla is very monumental and finely worked. Balkansky and his team (2000:381) believe that this can be explained by the fact that Achiutla was one of the most recent *cacicazgo* to be created. By erecting impressive buildings and monuments, it would have been a way to demonstrate the legitimacy and power of the newly established elite members of Achiutla to its inhabitants, but also to older, more established *cacicazgos*.

Leaders of the *cacicazgos* were called *yya toniñe* (Forde 2015:56). They were hereditary rulers (Cook and Borah 1968:14), and it is believed that men and women had the same power (Joyce 2010:47), based on the fact that the heirs were chosen by their parents after considering which alliances would prove the most advantageous, without considering the gender of their children. Marriage was one of the best ways to create alliances between different cities. Archaeological data and historical texts confirm the presence of secondary husbands or wives, demonstrating the existence of polygyny (Joyce 2010:209), which could have served as a way to multiply alliances. When a male *yya toniñe* and a female *yya toniñe* from two different *cacicazgos* married, their cities would be brought together and considered a single polity until the death of the two rulers

(Joyce 2010:47). If one of the two rulers died before the other, the remaining spouse would be in charge of both cities until their death.

Unfortunately, our information about the *cacicazgo* of Achiutla and its rulers is very limited. So far, mentions of Achiutla in Mixtec and Aztec codices do not provide much information about its inhabitants. I therefore rely on archaeological data collected by Jamie Forde and his team in 2013 at Achiutla (Forde 2015; 2017a) and from other archaeological data recovered in the *Mixteca* region (i.e. Balkansky et al. 2000; Blomster 2008; Joyce 2010; Pérez Rodríguez 2013). Historical sources are also an interesting way to learn about Achiutla during the Colonial Period (Burgoa 1934), which I am also forced to combine with other regional historical data (Hamiton 1929; Earle 2012), due to the small amount of historical texts mentioning the life in Achiutla. Finally, ethnohistorical sources (Monaghan 1996) are also a great way to learn about current Mixtec lifeways as a comparison with earlier practices.

Social Organization: A Look at Mixtec Hierarchy and Gendered Activities

The Mixtec hierarchy was composed of three groups (Terraciano 2001; Forde 2015:56). As mentioned earlier, the rulers, the *yaa toniñe*, occupied the top of the hierarchical pyramid. The second group was composed of nobles, called *tay toho*. Finally, the commoners, member of the third group, were called *tay ñandahi*.

<u>The *yya toniñe*</u>

The *yaa toniñe* occupied many roles during the Postclassic Period. They would have acted as judges and were in charge of any military action, including the defence of their cities (Joyce 2010:48). They were also owners of large parts of lands and would receive tribute in goods and labour from the *tay toho* and the *tay ñandahi* (Forde 2015: 56). The *yya toniñe* also acted as intermediaries between the Mixtec community and religious entities through the performance of religious ceremonies. In exchange for the services they received from their population, the rulers would sponsor communal feasts (Joyce 2010:48).

Though elite leaders were powerful during the Postclassic Period, their power was diminished compared to that of rulers in earlier time periods. This phenomenon might be due to the fact that people believed the rulers failed to prevent the demographic decline that occurred at the end of the Classic Period. Joyce (2010:250–257) identified archaeological evidence at Río Viejo that supports this idea. There, the space that was once the acropolis, a sacred space, was desacralized in the Postclassic Period, when people started building houses on it. This demonstrates that a shift in the power relation between the leaders and the commoners occurred during this time period. Joyce (2010:256–257) found an even greater example while excavating one of the houses. A carved stone representing the face of an ancient ruler had been transformed into a *metate*, and people would grind maize and other plants directly on the face on the ruler. This is a strong demonstration of what the commoner class was thinking of the ancient, powerful elite rulers.

Archaeologically, the presence of *yaa toniñe* can be confirmed through valuable offerings in graves (Joyce 2010), the gathering of objects of great value in caches and the presence of palaces. So far, at Achiutla the excavations have not led to the discovery of palaces or graves linked with the presence of *yaa toniñe*. However, local people of

Achiutla believe that the Spanish convent was built over the palace of Dzahuindanda, who is believed to have been the last *yya toniñe* before the arrival of Europeans in the region (Burgoa 1934:319; Forde 2015:101). If oral history is correct, this would confirm the presence of rulers at Achiutla, remains of which became subsumed under Colonial Period overburden.

<u>The *tay toho*</u>

The *tay toho* occupied administrative roles in the *cacicazgo*. They relied directly on the *yya toniñe* and had to offer them goods as tribute (Joyce 2010:48; Forde 2015:56). Joyce (2010:48) also argues that the administrative roles they occupied could be considered as labour tribute. As intermediaries between the *yya toniñe* and the *tay ñandahi*, the nobles had many functions (Joyce 2010:48; Forde 2015:56). First of all, they organized the collecting of commoners' tribute and planning labour obligations. They would also have been in charge of law enforcement, and called upon when disputes divided commoners. They would have been in charge of certain political and religious roles in the *cacicazgos*, such as taking the role of the *yaa toniñe* when the elite members were visiting another *cacicazgo* (Forde 2015:56–57). Finally, they were also specialized in craft production, including obsidian knapping and lead processing (Terraciano 2001:137; Forde 2015:182). The *yya toniñe* and the *tay toho* were easily identified by their clothing (Joyce 2010:48). They generally wore clothes made of cotton, feathers, and fur. They also had access to gold, and other rare and expensive materials such as precious stones.

Archaeologically, there are different ways to identify the presence of nobles. First, during the Postclassic Period in the *Mixteca Alta*, the nobles and the ruling elite tended to build their residences at the top of terraces, while the commoners were located lower (Forde 2015:126). It is also possible to identify an elite household with the "architectural investment" and with the presence of artifacts associated with craft production (Forde 2015:181–182). At Achiutla, the two houses excavated by Jamie Forde (detailed further on) have been linked with the presence of *tay toho*. At Terrace 13, the household excavated had low architectural investment, but lead debris were discovered, which led Forde to believe it was a house inhabited by low-status nobles rather than rich commoners, as the craft production of lead objects was associated with nobles at that time (2015:181–182). Terrace 10 is a large palace, which was identified as a *tay toho* household with a higher status than the other terrace excavated (Forde 2015:235).

<u>The *tay ñandahi*</u>

The last group, the *tay ñandahi*, is composed of three subgroups. They could have been free commoners, dependent commoners, or enslaved commoners (Joyce 2010:49). Both the free commoners and the dependent commoners would have been farming and specializing in various crafts (Joyce 2010:49–50; Forde 2015:57), a point I will expand in the next section. They would have provided tribute to the *yya toniñe* and the *tay toho*, both in the form of goods and communal labour. The free commoners owned their own land and were able to transmit it to their own kin (Spores 1984:131–135; Terraciano 2001:203–210; Forde 2015:57). The dependent commoners worked on land owned by the noble class. They still had a political power, as they were free to leave the land and go work for somebody else if they felt exploited (Forde 2015:57). Enslaved commoners were also members of the *tay ñandahi*, although they had fewer rights and privileges. Nobles would enslave commoners by capturing enemies during battles (Joyce 2010:50). Enslaved commoners were under the orders of their slavers and could be traded as a form of tribute. Enslaved commoners were also often victims of sacrifices during religious rituals (Joyce 2010:50).

Archaeologically, it is difficult to clearly identify the presence of enslaved commoners in the region, a problem that the Spaniards also faced during efforts at colonization. During the 16th century, Dominican friars created Mixtec dictionaries. While translating Mixtec words into Spanish, they found out that the Mixtec used the same word to designate "slaves" and "serfs" (Cook and Borah 1968:14–15), making it very hard for the Spaniards to understand who was a commoner and who was enslaved. Archaeologically, the presence of commoners can be identified using different artefacts. When the preservation is good enough, it is possible, although extremely rare, to find maguey fiber clothes, which were usually worn by *tay ñandahi* (Joyce 2010:49). They usually lived in houses made of thatch, daub, and adobe, which differ from the monumental architecture used by the nobles and the elite members (Joyce 2010:49).

As mentioned previously, at Achiutla, the two households excavated were identified as being the homes of nobles. We can indirectly infer the presence of the commoners by the presence of many terraces located below Terraces 10 and 13, which could have been occupied by commoners (Forde 2015:126). The role of commoners is important in this research, as they likely were the ones cultivating the crops consumed at the two households investigated here. By learning about what the occupants of Terraces 10 and 13 were eating, we can understand which crops were grown at Achiutla in enough quantity to be given as tribute and, hopefully, consumed by the commoners who harvested it.

<u>Gender Equality (Or Nearly)</u>

As mentioned earlier, there were no clear distinctions between male and female *yya toniñe*. Both were able to rule a *cacicazgo* and choose their successor. When these leaders would marry and create an alliance, it would stand until the death of the second spouse. Therefore, it was possible for female or male *yya toniñe* to rule two *cacicazgos* at the same time without any restriction associated with sex or gender.

King (2006) studied the social distinctions between men and women in households located in the *Mixteca de la Costa* region during the Postclassic. Even given the differences between the three different Mixtec regions (*Mixteca Alta*, *Baja*, and *de la Costa*), they still shared important cultural components that defined general Mixtec culture and identity. King's study was based in part on mortuary practices. She established that the tombs of men and women of the same status were equally rich (King 2006:184). In Cholula, it was even possible to identify artifacts linked with weaving in both male and female tombs (King 2006:184). She compared these results with Río Viejo, a Mixtec village near the coast occupied during the Postclassic Period, where there was not any artifact linked with this activity in any of the tombs. She believes the strong occurrence at Cholula and the absence of hints of this activity in Río Viejo's tombs could mean that both men and women participated in weaving (King 2006:184).

Based partially on this burial data, King believes that the Mixtec division between male and female tasks was "complementary", rather than "hierarchical" (King 2006:183). Joyce (2010:47) also described the relation between male and female nobles as "near […] equality". King extends this idea to the commoner class as well. Even if there was not a strong distinction between men and women of the same status in the Mixtec culture, there was a strong social distinction based on age (King 2006:185; Pérez Rodríguez 2013:92). Young children had fewer privileges and were not given the same status as adults.

Agriculture and the Economic System in the *Mixteca* Postclassic

The Mixtec economic system was primarily based on farming (Spores 1984:80–82). Annually, there was generally enough rainfall in the *Mixteca Alta* region to enable people to cultivate maize without irrigation (Forde 2015:52). However, it was critical for the Mixtecs to be able to capture and store water, as the rainy seasons varied greatly annually in "timing, duration, and intensity", leading sometimes to dry years (Joyce 2010:52). Therefore, storing water was a way to diminish the uncertainties around the ability to raise crops. To do so, they developed the *lama bordo* terracing system (Spores 1969:563; Joyce 2010:52–53). Mixtecs built retaining walls made of stone and rubble that would trap and redirect the water coming down the hillsides to their fields (Spores 1969:563). It was also a way to control erosion. According to Spores (1969:563), it must have taken around two to three years to obtain a very efficient soil that would produce maize and other crops. The vestiges of these walls are still visible today in some places. This is not surprising, as they measured up to 200 m long and 4 m high (Spores 1969:563). Some of them are even still in use (Joyce 2010:52), a sign that this system provided great results. Pérez Rodríguez (2006) believes that commoners might have constructed the *lama bordo* terraces without any intervention of the rulers (Forde 2015:59).

Current evidence, such as the presence of bell-shaped pits capable to store a quantity of maize that could suffice to feed a family for a year (Winter 1976:27; Joyce 2010:77), points toward the hypothesis that the *tay ñandahi* were producing agricultural surpluses (Spores 1984:81; Joyce 2010:50; Forde 2015:57). These surpluses would have served as tribute given to the *tay toho* and the *yya toniñe*. They also brought other surpluses into the markets and traded them in order to obtain other items the households were not able to provide for themselves (Joyce 2010:55). Commerce was possible between households of the same villages, but also between villages (Joyce 2010:54), which would have created an opportunity to obtain exotic ingredients and products, including plants. There is also archaeological evidence of craft specialization in the *Mixteca Alta* region. Joyce (2010:54) believes that even if they were primarily farming, the majority of the households would have been producing other goods, such as textiles made from the maguey plant. These products would have also reached the markets through long-distance traders. The nobles and elite members of the *Mixteca Alta* were trading domestic products, such as *cochinilla* insects for dyes, *pulque* (a fermented agave drink), and agricultural surplus, such as maize, to obtain exotic goods from the *Mixteca Baja* and the *Mixteca de la Costa*, like cotton, cacao, fish, tropical fruits, salt, and quetzal feathers (Joyce 2010:54, 77).

At Achiutla, there is also strong archaeological evidence for obsidian crafting (Forde 2015:326). The majority of obsidian materials were imported from Pachuca, located in central Mexico, and crafted in different shapes before being traded locally and regionally (Forde 2015:326–332). The obsidian from Pachuca is green, which makes it easy to identify archaeologically. Given that craft production was mainly associated with the nobles (Forde 2015:181–182), it is probable that the elite were controlling the importation and the exportation of the obsidian through established networks.

Mixtec Religious Beliefs and the Role of Achiutla

Postclassic Mixtecs believed that the world they were living in was alive, a cosmological perspective still upheld by many contemporary Mixtec people (Pohl and Byland 1990:115). There was a force, called *ini* or *yii* present in plants, peoples, and animals (Joyce 2010:56). Mixtecs considered them to be connected with humans, tied by the life force (Pohl and Byland 1990:115; Joyce 2010:56). Mixtecs also believed the earth possessed this force (Pohl and Byland 1990:115; Joyce 2010:56), through rivers, mountains, wind, and earthquakes. Abstract concepts, such as their sacred calendar, were alive as well. Therefore, their environment was conceived as being made of spirits with whom they had to interact (Pohl and Byland 1990:115).

Mixtec religious beliefs also included many deities, including one associated with maize (Joyce 2010:56) and noble ancestors or founders of new *cacicazgos* (Joyce 2010:58). Their images were crafted in stones or precious materials and were often placed in sacred bundles (Joyce 2010:56). In order to celebrate and please the deities, Mixtecs offered different items to them. It was not rare for Mixtec people to donate ground tobacco seeds and copal incense (Blomster 2008:337). They also organized feasts and sacrifices where they would dance and play music (Joyce 2010:60–61). During these events, Mixtecs sometimes consumed diverse psychotropic substances, including tobacco, alcohol (such as *pulque*, a beverage made of maguey), and hallucinogenic mushrooms (Joyce 2010:60–61). Animals and humans could be sacrificed, and autosacrifice was carried out through blood-letting ceremonies (Joyce 2010:62). Members of the elite had a special role during these ceremonial events because they were seen as intermediaries between the deities and the rest of the populace. However, commoners' access to these deities was not entirely dependent on the elite, as they could take part in certain ceremonial activities on their own, such as sacrificing an animal or offering goods to a deity (Joyce 2010:63).

In the myth of creation related in the Vienna codex, a book composed of pictograms and glyphs drawn on deerskin and dating from the Prehispanic time, it is said that the first people came from sacred trees (Blomster 2008:337). It was believed that Achiutla had two sacred trees that gave life to many ancestors of the *yaa toniñe* of the *Mixteca Alta* (Forde 2015:6–7). Achiutla was also believed to be the home of one of the most important sacred ancestors in the Mixtec culture, Lady 1 Death (Blomster 2008:343). Because of its sacred trees and its presence in the genealogy of many rulers across the region, Achiutla became the "most important religious centre in all of the Mixteca Alta" during the Postclassic Period (Burgoa 1934:318–319; Forde 2015:7). It was important for rulers throughout the Oaxaca Valley to prove they were associated with Achiutla's genealogy in order to legitimize their position. Historical texts mention that the ruler of Tilantongo, a neighbouring *cacicazgo*, made the pilgrimage to Achiutla at the start of his reign in order to demonstrate his legitimacy (Burgoa 1934:275–276; Byland 2008; Forde 2015:70).

Achiutla obtained the rank of a religious centre not only because of its two sacred trees, and origin of Lady 1 Death, but also because of the presence of a great oracle (Blomster 2008:343; Forde 2015:7), who was believed to be an intermediary to Lord 1 Death (Burgoa 1934:318; Forde 2015:72). According to Burgoa (1934:77; Forde 2015:8), even the emissaries of an Aztec emperor visited the oracle when the Spaniards arrived in the Americas, demonstrating its reputation outside of the region. The presence of the sacred trees and the oracle, along with the origin story of Lady 1 Death, can explain the status Achiutla obtained, even if it was one of the youngest *cacicazgos* of the *Mixteca Alta*. Achiutla continued to be one of the primary religious centres of Oaxaca until the arrival of Spaniards.

The Aztec Conquest

Achiutla came under Aztec control between 1504 and 1512, depending on the different interpretations made of codices (Cook and Borah 1968:19; Hassig 1988:232). The Aztec expansion in the *Mixteca* region began in 1458 under the ruler Moctezuma Ilhuicamina and continued during the reign of Moctezuma II when Tlaxiaco and Achiutla were conquered, along with neighbouring *cacicazgos* (Forde 2015:61). The Aztec conquest seems to have been peaceful at Achiutla and did not greatly affect the social, political and economic dynamics already in place, with the exception of a new tribute Mixtecs had to give to the Aztec leaders (Forde 2015:62). The tribute was composed of exotic goods, such as quetzal feathers and cotton, which were only available in the *Mixteca de la Costa* (Forde 2015:62). Forde (2015:63) believes that it was a way for the Aztec to obtain these goods through the already existing trading routes. As Forde (2015:62–63) and Gutiérrez Mendoza (2013) mention, there are codices describing the possibility for Mixtec people to pay tribute with the equivalent value in gold of the exotic products they could not get. The Aztec expansion seems to have been driven by economic reasons and the focus of it was not to transform the order already established in the *Mixteca* region, which differs completely from the Spanish Conquest that started a century afterward in the *Mixteca Alta.* Rather, Aztec rule was focused on maintaining hierarchies and tribute pathways, with the difference being that tribute was redirected to the Aztec Empire.

The Spanish Arrival in Oaxaca

The Spaniards made their first expeditions in the *Mixteca* region in 1519 and took control of it in 1523 after the fall of the Aztec centre of Tenochtitlan (Forde 2015:63–64). The Spanish conquest, led by Pedro de Alvarado, met little resistance in Oaxaca, with the exception of the empire of Tututepec, near the coast (Forde 2015:63–64). The arrival of the Spaniards in the region was motivated with the wish to convert the Indigenous groups to Catholicism, conquer new lands, acquire more wealth, and gain new subjects (Warinner et al. 2012:467). Unfortunately, we do not have any information about the conquest of Achiutla (Forde 2015:8). As Forde (2017a) has described, Achiutla was at the periphery of New Spain. Because of its remote location from the colonial centres, Spanish authority had less control, and had to rely more on Mixtec co-operation, to organize both public and private life. This also impacts our knowledge of the situation in Achiutla, as the historical records mentioning it are limited.

Mixtecs resisted colonial power in many ways. One way to contest the power in place and ensure continuity of culture was to preserve and reinforce religious heritage. One of the main goals of the Spaniards was to evangelize the Mixtecs. Therefore, the traditional Mixtec religion was banned in order to convert Mixtecs to Christianity. Several historical texts describe trials (Joyce 2010:56; Forde 2015:318) involving Mixtecs that had hidden idols in their houses, vaults, and other secret places. This demonstrates the presence of resistance behaviour in some households in Mixtec villages. I believe that other acts of resistance might have taken place in households, and in some cases directly linked with foodways. There were also many events of public resistance, targeting the newly established town council, the *cabildo*, and also targeting Catholic friars. As mentioned earlier, it was safer for Mixtecs to resist in their everyday lives, hidden in their homes, rather than the public acts, where they were more exposed and risking to be punished.

Mixtec Hierarchy During the Early Colonial Period

During the Early Colonial Period, the Spanish *conquistadores*, like the Aztec before them, kept the traditional Mixtec political structures relatively in place (Spores 1984:66; Lind 1987:101; Forde 2015: 5). However, certain *cacicazgos* in the *Mixteca Alta* were moved, an event that was called *congregación* (Terraciano 2001:119). Achiutla, like many other polities, avoided this process. The *congregación* happened in only a few regions in the *Mixteca Alta*, although it is not clear why certain polities were moved while others were not. The goal of congregation was to move the population from the mountains to the valleys, effectively recreating a Mediterranean lifestyle (Terraciano 2001:119) and enabling the production of Mediterranean crops. The process came late in colonization, and was perhaps in this case related to the sudden demographic decline related to epidemics, thus creating an increase of available lands in the valleys (Terraciano 2001:119). At the time of the Conquest, the Mixtec population was estimated to be around 700,000 and decreased to around 57,000 by 1590, vastly due to diseases that kept hitting the Mixtec population until the end of the seventeenth century (Cook and Borah 1969; Warinner et al. 2012; Forde 2015:63–64).

The Spaniards kept the hierarchical pyramid that was in place before their arrival in the Americas, but added themselves on top of it as the major beneficiaries of wealth and labour (Spores 1967:120; Lind 1987:102). When they established themselves in the Oaxaca Valley, the Spaniards created a new institution, the town council, called the *cabildo* (Lind 1987:102). It was composed of a governor, an *alcalde mayor*, and other members of the Spanish administration. The governor was in charge of many *cacicazgos* and delegated powers to the *alcalde mayores* for different regions. The *alcalde mayores* were in charge of applying the law and acted as judges (Forde 2015:66). At Achiutla and elsewhere, under the watch of the *alcalde mayor*, the *yya toniñe* kept ruling the *cacicazgos*, although their name was changed to *caciques*, an indigenous Carribean term borrowed by the Spaniards (Lind 1987:101) and the obvious origin of the term *cacicazgo*. The *yya toniñe/cacique*s kept the majority of their powers and could continue making alliances between different *cacicazgos* by marriage as they were doing during the

Postclassic (Forde 2015:66–67). However, *yya toniñe*/*cacique*s were also made to collect tribute in goods and labour for the Spaniards, based on the newly created *encomienda* system I will describe in the next section (Forde 2015:67).

The relationship between Spaniards and Mixtecs were often difficult. In Achiutla, and probably throughout the Mixteca region, the *alcalde* mayor was caught in the middle of at least two public resistance events. In 1580, the Mixtec population imprisoned one lieutenant of the *alcalde mayor* after he arrested a commoner for being intoxicated during a town festival (Romero Frizzi 1996:196; Pérez Ortíz 2009; Forde 2015:7, 79). In 1629, the Mixtec population imprisoned the *alcalde mayor* himself for having borrowed the horse of a commoner and having provided him with a low compensation in return (Romero Frizzi 1996:196; Forde 2015:7, 79). After these events, and after every minor act of resistance of the Achiutla Mixtec population, the Spanish authorities gave "minor punishments" to the Mixtec people involved and thus avoided any bloodshed (Forde 2015:79). I would suggest this lenient way of dealing with minor insurrections was to avoid creating a larger Mixtec revolt. It was safer to deal calmly with rare, minor acts of resistance than creating martyrs under a strong and violent repression that could considerably elevate the tensions between the Spaniards and the Mixtecs.

This philosophy about lenient punishment after mass population uproars is still present today, and I believe the case of Noxichtlan, Oaxaca, fits in this category. Last year, during a protest that became violent, police officers killed several people, creating an immense reaction of anger from the protesters. Trucks, buses, hotels, and even the police station were burnt that night and the police was forced to leave. More than a year after the events when I was doing fieldwork in the region, I was told by local inhabitants that the police have not set foot back in Nochixtlan, and so the residents organized a town police service. When I was visiting the town, I felt the tension that still exists, which could become extremely dangerous if the government and police forces decided to go back there without being invited to do so.

The *Encomienda* System During the Later Colonial Period

After the initial *congregación* and reorganization of *cacicazgos*, the Spaniards established the *encomienda* system throughout their colonies. *Conquistadores* and other Spaniards were given *encomiendas*. The owners of *encomiendas* were not entitled with land ownership, but rather received authorization to collect tribute in goods and labour in the communities assigned to them (Spores 1967:87; Lind 1987:102; Forde 2015:64). Between 1530 and 1540, the Spanish Crown established limits in what the Spaniards could collect and the labour they could force the Mixtecs to realize (Spores and Balkansky 2013:145; Forde 2015:64–65). Terraciano (2001:2–3) believes this system was instituted in the *Mixteca Alta* region between 1525 and 1530. Historical reports do not reveal when the *encomienda* of Achiutla was created, but we know that it belonged to Francisco Maldonado in 1550 (Spores 1992:8–9). Forde (2015:65) notes the *encomienda* of Achiutla could only be transferred to three generations, after which it came back to the Crown of Spain.

With the establishing of the new tribute required by Spanish law, Mixtecs were coerced into different labour practices (Forde 2015:65). During the Early Colonial Period, Mixtecs started raising livestock such as cows and sheep (Spores 1984:127–128), and cultivating wheat (Spores and Balkansky 2013:146). In Achiutla, the Mixtecs were also forced to produce silk (Borah 1943; Léon 1982), which ended up being especially lucrative for the Spaniards compared to other *cacicazgos* (Forde 2015:77). The production of silk was also lucrative for indigenous communities, as the profits remaining after paying the tribute were placed in the "community chest" (Léon 1982; Forde 2015:77). The historical accounts also show that Achiutla commoners probably had to work in silver and gold mines between 1550 and 1565 (Spores 1984:126; Forde 2015:75). After this date, there is no mention of any extraction of these metals in the *cacicazgo*, which suggests this project came to an end. During this period, the obsidian crafting activities also decreased, probably due to a decline of population that would have weakened the trade routes and maybe also because of Spanish interference (Forde 2015:331). Moreover, we see iron becoming more present in archaeological contexts associated with Mixtec elites (Forde 2015:335).

During the *encomienda* period, markets were still present (Forde 2015:336). It is likely that Mixtecs kept producing sustenance goods at the household level. However, the crafts produced seem to have changed, as craft production switched from the maguey textile to silk, and obsidian to iron. The *alcalde mayor*, with the help of the *caciques*, was in charge of collecting the tribute in goods and organizing the labour. This created tensions with the Mixtec commoners in Achiutla. In one example, a group of *tay ñandahi* lodged a complaint against the Mixtec rulers and the *alcalde mayor*, who would have raised the tribute and made it unfair (Terraciano 2001:240–241; Forde 2015:9). This demonstrates that some Mixtec commoners resisted not only the Spaniards, but also took an active role in the Spanish institutions in order to defend their rights.

Religious Transformations and Resistance in the Colonial Period

Historical documents mention that the construction of the convent started in 1556–1557 in Achiutla (Gerhard 1972:287; Mullen 1975:40; Forde 2015:77–78). However, there is no information about the possible presence of Spanish friars prior to the convent being built. When they set foot in Achiutla, the Dominican friars banned Mixtec deities and their representations (Joyce 2010:56). Their goal was to convert the Mixtecs to Catholicism and enable them to be received in Heaven. It is believed that the convent in Achiutla was constructed right on top of the palace of the rulers as a way to send a strong message about the importance of the Church and the Catholic religion (Forde 2015:73). Mixtecs themselves would have built the convent, and been forced to provide labour and materials (some likely from the razed palace) (Forde 2015:77). Traditional ritual ceramics, such as censers and braziers, often used to burn offerings, were also banned, which led to their decline in the archaeological assemblage over time (Forde 2015:346). Obsidian blades associated with sacrifices also declined during this time period (Forde 2015:346).

In spite of these Mixtec shifts in practice under Spanish duress, historical accounts demonstrate many conflicts between the friars and the Mixtec population, indicating efforts to preserve Mixtec traditional rituals. The first friar to establish himself permanently in Achiutla had to leave and move to another *cacicazgo,* because he felt his life was threatened after being harassed by Achiutla's inhabitants (Burgoa 1934: 322;

Forde 2015: 8). His successor, friar Benito Hernández, was imprisoned in his home without any access to food or water. This may have indicated an intention to kill him slowly, but the friar's neighbour found a way to feed him secretly (Burgoa 1934:330–331; Forde 2015:8, 78–79). These events are probably due to the pressure the Dominican friars exerted on the Mixtec population to convert them to a new religion and reject their ancient beliefs. Mixtecs also used the Spanish tribunals to complain against Spanish friars of Achiutla. In 1591, a group of Mixtec nobles complained against friars that had allegedly fined, whipped, and even imprisoned Mixtec people (Terraciano 2001:340; Forde 2015:8–9).

Clearly, Achiutla's inhabitants' relation with the clergy was tense. Burgoa mentions (1934:322; Forde 2015:8–9) that these tensions became less present when the Mixtec people converted to the Christian religion. However, these events of resistance demonstrate that there were many people angry towards the friars, who also represented the Spanish authority. As I will demonstrate in the next chapter, foodways were very important for the Spanish friars, and modifying Mixtec foodways was seen as one of the ways to evangelize the Indigenous groups. Considering the public resistance against the church, it is highly plausible that the Mixtecs refused to Europeanize their foodways in their homes, where it was harder to monitor their activities.

Historical Trajectories at Achiutla

The Late Classic Period (500–800) finished with a decrease in population and the abandonment of many large cities in the *Mixteca Alta* region. However, Mixtecs proved to be resilient and established themselves in many different semi-autonomous kingdoms, or *cacicazgos*, in the Postclassic Period. Although the Classic Period saw demographic declines, the Postclassic Period saw a strong resurgence of Mixtec populations. With the demographic increase, the elite lost some power, but the hierarchy remained the same, with the rulers, the nobles and the commoners in a fairly stable class structure. The economy remained largely based on terracing activities and the Postclassic Period proved to be a great opportunity to develop the trade routes already in place.

During the Postclassic Period, Mixtec culture changed in many ways, partly as a result of internal dynamics and partly in reaction to Aztec incursions. Mixtec elites lost some of their prestige and certain Mixtec ritual beliefs were abandoned to make place for others. The Postclassic Period is associated with the emergence of the *cacicazgos* (including Achiutla) and the expansion of trade routes. During this time period, their hierarchy was well established and their ritual beliefs were diverse and included many deities. The Aztec Conquest, which occurred a century before the end of the Postclassic Period, did not clearly impact the Mixtec lifeways. Mixtec people kept their political, economic, and social dynamics, with the addition of extra tribute to the Aztecs. The Aztec conquest probably opened new markets and trade routes with Aztec polities, now more easily reachable.

When the Spaniards arrived in the *Mixteca Alta* and in Achiutla, they imposed many new institutions. The *encomienda* system and the *cabildo* forced the Mixtecs to change their crafting activities and to give tribute in goods and labour to the Spaniards. Friars were sent throughout the region to evangelize the Mixtecs and banned their traditional religious beliefs as part of this process. However, the Mixtecs proved to be resilient, fighting to preserve their cultural institutions and religious practices in the public space and in their households. Moreover, although the colonial encounter changed and modified the Mixtec culture and identity to a certain extent, the Spanish culture was also transformed.

A lot is unknown about Achiutla's people's response to the Spanish conquest, due to a lack of available records and limited archaeological work. They resisted publicly, sometimes violently, against the Spanish authority, their political and religious systems. There is little known about the everyday life and how Mixtec people negotiated the Spanish territorial expansion in their households. Studies of foodways, however, provide a great insight into these questions.

Chapter 3: Foodways as a Way to Understand the Past

In this chapter, I discuss evidence of Mixtec and Spanish foodways prior to and during the Early Colonial Period. As I will demonstrate using historical and archaeological data, the movement and consumption of foodstuffs played a key role during the colonization process. Some prior studies have addressed historic documents, *lienzos*, codices, and zooarchaeology (Hamilton 1929; Léon 1982; De France 1993; 1996; 2003; 2012; Alves 1994; Earle 2012). However, current archaeological studies of foodways in the *Mixteca Alta* during the Colonial Period have yet to include paleoethnobotanical data, a key component to get a full understanding of Mixtec foodways.

I begin this chapter by introducing traditional Mixtec foodways, exploring the food items consumed (i.e. maize, squash, rabbit, etc.) and the diverse uses of the plants traditionally associated with this culture. I also explore differential access to food items, as dependent on social status. As I explain, commoners were sometimes unable to eat certain luxury food items generally limited to the nobles or the ruling elite. I then examine traditional Spanish foodways, in terms of their diet (i.e. wheat bread, pears, lamb) and the important role that food played in their lives. As it was the case during Mixtec and then Aztec rule, commoners' access to food items was limited by their lack of wealth. Using mostly historical data, I demonstrate that Europeans believed it was crucial for them to keep eating the foods they were accustomed to in Spain in order to keep their cultural identities intact, sometimes stated explicitly and sometimes expected nondiscursively.

Within this section, I explore the vision of the Spanish Church in terms of Indigenous foodways. As grape wine and wheat bread were a key component of Catholicism, many priests believed that Mixtecs and other Indigenous communities had to consume these foodstuffs in order to be truly converted. However, there is evidence that not everyone shared this idea and the forced consumption of Spanish foods sometimes became a way to show domination. Finally, I present the historical and archaeological data gathered on foodways during the Colonial Period in the *Mixteca* region broadly, finishing with the zooarchaeological study made at Achiutla. As it will be possible to see, the presence of introduced species varies greatly depending on the *cacicazgos* studied.

Foodways in Colonial Times: An Archaeological Overview

Globally, many archaeological studies have been made of foodways during the Colonial Period, focusing both on the Indigenous diet and on the colonists' (West 1989; Ruhl 1990; Scarry and Reitz 1990; Bushnell 1991; Reitz 1992; De France 1993; 1996; 2003; 2012; Reitz and McEwan 1995; Deagan 1996; 2015; De France et al. 2016; Kennedy and VanValkenburgh 2016). The results vary greatly. Most studies focus on historical data or zooarchaeology. Paleoethnobotanical studies are still rare in the Americas, in part because of the low number of paleoethnobotanists, combined with the lack of equipment and reference collections (Pearsall 2015). I would also add the fact that combining European and American plants in botanical analysis, in particular for microbotanical ones, makes the process harder, as researchers have to know both sets of plants to proceed with analysis.

Results of historical and zooarchaeological studies of Indigenous foodways vary greatly, depending on many variables, including the economies, politics, and cultures involved. In certain places, foodways continued to be based on local, American resources, such as in St. Augustine (La Florida) (Bushnell 1991) or at Cruz Pampa in the Andes (De France 2012). At St. Augustine, a Spanish colony, Europeans and Indigenous foodways were based on maize and not wheat, supplemented by local plants and animals (Bushnell 1991:11). According to Bushnell (1991:10–12), St. Augustine local foodways during the Colonial Period can be explained by geographical and political factors. St. Augustine was isolated from the other colonies and there were many pirates in the area, discouraging many merchants from sailing to the colony, which meant that "supply ships were sometimes years apart" (Bushnell 1991:12). With a limited access to European resources, the colonists had to rely on local resources in order to survive. At Cruz Pampa, a colony composed of Indigenous people and Spaniards, zooarchaeological analyses were made on samples dating from the Colonial Period up to the first half of the seventeenth century (De France 2012). The results show that the inhabitants of Cruz Pampa "principally" ate local Indigenous animals (De France 2012:20). Archaeologists also food bones of lambs or goats, European introduced species, to a small extent, with the addition of European artifacts (De France 2012:21). Susan De France explains it is difficult to determine if the relative absence of European animals is due to "personal preferences" or the difficulty to obtain access to those animals through the markets (De France 2012:21).

At Tarapaya, located a few kilometers from Cruz Pampa, zooarchaeological food remains examined were by far dominated by European introduced species, mostly sheep and chicken (De France 2012:21). There were also a few bone remains of species consumed in pre-Hispanic time, such as fish, deer and alcapas (De France 2012:21). The colony, Cruz Pampa, was composed of Indigenous and European people. However, De France (2012:22) noted the absence of European material culture in the archaeological record, leading her to believe that the consumption of European introduced species might have been a way to demonstrate prestige and to separate the Spaniards from the Indigenous people. At Tarapaya, the high elevation limited the amount of animals able to live there, which forced people to obtain their meat from the neighbouring markets (De France 2012:11). De France (2012:22) believes that the Spaniards, having a higher status than the Indigenous people at Tarapaya, might have been able to afford to buy and import food more easily than the Indigenous people, thus explaining the domination of European zooarchaeological specimens.

Finally, in the Moquegua Valley, in Peru (De France 1996), archaeologists found a mix of a diet based on local Indigenous food items and European introduced species. In the Moquegua Valley, De France identified bones of introduced cattle and sheep alongside bones of Indigenous llamas, fish, and shellfish (De France 1996:42). The archaeological sites analyzed in the Moquegua Valley date from the sixteenth and seventeenth centuries. De France (1996) believes that both Indigenous and European people might have consumed these animals, meaning that Indigenous people did include those new animals in their diet. As mentioned earlier, when determining if an object (or in this case zooarchaeological remains) can be tied to hybridity, the context is the most important information to analyze. Unfortunately, we do not know how these animals were cooked and consumed. Were they prepared following the traditional Iberic foodways or were the European introduced species included in traditional foodways? I believe that by combining zooarchaeological data with paleoethnobotanical ones, it provides more possibility to analyze the context in which the food items are recovered and identify possible instances of hybridity or resistance, the aim of my research. This thesis focuses on plant remains analysis, which I am able to combine with the zooarchaeological work done by Silvia Pérez Hernández at Achiutla, in order to obtain a greater comprehension of the foodways at Achiutla during the Postclassic and the Early Colonial Period. In order to identify the contexts behind the food items recovered at Achiutla, it is important to understand what Mixtec and Spanish ate and how they perceived their foodways.

Traditional Mixtec Foodways

As in the broader Mesoamerican area during the Postclassic Period, the Mixtecs relied both on agricultural and wild resources (Joyce 2010:51). The plants most commonly produced and consumed were maize, beans, squash, tomatoes and chile peppers (Cook and Borah 1968:9; Joyce 2010:51). An isotope analysis done on human remains at the archaeological site of Yucundaa, Oaxaca, demonstrated that the Mixtec diet was predominantly based on C4 plants, such as maize and amaranth, while CAM plants such as agave and cactus fruits rounded out the diet (Warinner et al. 2012:483). Joyce (2010:51) also mentions Mixtecs consumed avocados, a plant that he argues was very important in the Mesoamerican diet.

Maize was the main component of Mixtec foodways. It was grown locally, using the *lama bordo* terrace system described in the previous chapter. This terrace system was delimited by retaining walls made of stone and rubble that would store and channel the water on the fields. Mixtecs mastered the *nextamalli* process (nixtamalisation in English) (Brumfield 1991:237–238; Coe 1994:114; Gasco 2005:81; Widmer and Storey 2016:264). Still used today, the principle is to soak maize in alkali water, obtained by adding limestone and occasionally wood ashes. The mixture increases the amount of calcium, proteins, and niacin in maize, while softening the kernel's hull, rendering the grinding much easier (Brumfield 1991:237–238; Coe 1994:114; Gasco 2005:81; Widmer and Storey 2016:264). Maize could be transformed in many ways, whether fresh, boiled, roasted (*elote*), dried, or ground to transform into porridge, tortillas and tamales (Wetterstrom 1986:15; Brumfield 1991:239; Beck 2001:189; Stross 2006). Maize was also used in thick beverages such as *atole* and *pozole* (Stross 2006; Green 2010:317). All of these practices indicate the ways that maize was a cornerstone of Mixtec daily life.

Maize played an important role in everyday life, as a common and staple foodstuff, but moreover the place of maize in rituals accentuated its importance for the Mixtecs. Maize was very important in Mixtec traditions, including wedding ceremonies (Monaghan 1996:183–184). While on fieldwork in Oaxaca, John Monaghan witnessed a Mixtec wedding in the town of Santiago Nuyoo. Before the ceremony began, a pile of tortillas was placed in front of the lovers. Near the end of the ceremony, the father of the bride took one tortilla and cut it in half. He gave half to his daughter, and half to his groom, while telling them that by eating it, they would "grow and speak together". Maize continues to play different symbolic roles in the Mixtec culture, including the power of creating bonds between people. During contemporary communal feasts, maize is also used as a way to tie households together (Monaghan 1996:189–191). The sponsors of the feast will prepare many tortillas, but the guests will also bring a certain number of them, depending on their social status and what they received from the hosts the last time they received them during a similar event. During the feast, the sponsors will redistribute the tortillas received, making sure that people do not receive the tortillas they prepared. This creates a dynamic movement, where the labour of every household is redistributed, creating the "equivalent relationships between people of the same household", an idea John Monaghan supports with many citations from interviews with Mixtec inhabitants of Santiago Nuyoo (Monaghan 1996:191).

As mentioned in the earlier chapter, maguey was produced for its fibers that could be used as textiles, but it could also be transformed into syrup, sugar, and wine (Serra and Lazcano 2010:141). Maguey is the principal ingredient of the alcoholic beverage *pulque*, which was used for ceremonial purposes, and also consumed during feasts. Researchers believe that *pulque*, alongside cacao, were two foods traditionally reserved for the elite (Joyce 2010:48). There are many varieties of maguey present in Oaxaca, certain being cultivated (*Espadin*, *Blue agave*), while many species are wild (*Tobalá, Barril, Arroqueño*), providing a variety of available species to the Mixtecs.

Mixtecs also consumed various types of meat. Before the arrival of Spaniards, Mixtecs had already long cohabitated with two domesticated animals: dogs and turkeys (Spores 1967:6; Cook and Borah 1968:10; Joyce 2010:53). Zooarchaeological research also identified bones of diverse local animals, such as deer, rabbit, peccary, birds, and iguanas (Joyce 2010:53). Microfauna also played a great role in Mixtec foodways (Cook and Borah 1968:10; Widmer and Storey 2016:269). Insect consumption during Mixtec rule, as now, would have been a great way to obtain a protein intake quickly (Widmer and Storey 2016:269). Today, in Oaxaca, insects are still present in foodways and you can easily find grasshoppers (*chapulines*), worms (such as the *gusano de maguey*), or ants (*chicatanas)*, to name a few. These insects are found in a variety of dishes, including *tostadas, chilaquiles,* and *tacos*. The study of insect remains, entomo-archaeology, would be interesting to develop in Oaxaca, as it would likely lead to a better understanding of the Mixtec foodways and relationships with the environment.

The access to many of these foods was controlled in part by the elite and noble class. Commoners had access to wild plants and the ones they were cultivating in their fields, but the elite controlled and limited access to cotton and cacao beans, two sumptuary plants (Joyce 2010:48). These plants were grown in the lowlands and coastal regions and traded via established trade routes along the *Mixteca* and beyond (Joyce 2010:54). Commoners could hunt and eat insects, reptiles and small mammals, but based on archaeological data comparing zooarchaeological remains in households of different status, turkey, deer, edible dog, rabbit, and wild fowl were reserved for the ruling elite and the noble class (Spores 1967:6–8; Cook and Borah 1968:10; Houston 1983:218). The ruling elite and the nobility controlled high production of alcohol as well (Serra and Lazcano 2010:154). As mentioned in an earlier chapter, the *yya toniñe* organized communal feasts, and during these events the commoners were provided access to food items usually not allowed to consume or restricted in consumption (Spores 1967:6–8).

The two households analyzed in this research are associated with the noble class. Given historical, archaeological, iconographic, and contemporary evidence of foodways in the *Mixteca Alta* region, the assumption is that their inhabitants should not have faced dietary restrictions due to their high ranking. I therefore expected to find food items linked with local production, such as maize and squash, and also open to the possibility of finding exotic plants, such as cacao beans. By their prestigious social status, the occupants of Terraces 10 and 13 were able to decide which food they would acquire as part of the tribute, representing the values of certain food items compared to others, such as a preference for cultivated plants rather than wild resources in any cases.

Aztec Foodways

With the Aztec Conquest and the establishment of new commercial routes, I believe it is possible the Mixtecs were exposed to a certain extent to Aztec foodways. I will briefly summarize the general Aztec foodways, although they might not have impacted the traditional Mixtec diet. Combining historical, archaeological, and ethnohistorical data, it is possible to reconstruct Aztec pre-Hispanic foodways. According to Staller (2010:54), the traditional meal consumed by the Aztec commoners before the Spanish Conquest “consisted of tortillas, a dish of beans, and a sauce made from tomatoes or peppers”. Commoners would also regularly eat maize porridge with honey or peppers (Staller 2010:41–42). The main plants consumed would have consisted of “maize, amaranth, beans, cucurbits, and chilies” (Staller 2010:45). The insects were important food items as well, especially the *maguey* worm, its distinctive taste being very popular (Staller 2010:39–40; Tate 2010:511). The local environment also influenced the Aztec foodways. For example, villages nearby bodies of water would often eat marine resources, such as axolotl, fish, shrimps, frogs, and algae (Tate 2010:514). The Aztec elite members would often drink vanilla *atole*, a beverage made from maize dough. Along with vanilla, cacao was an important plant for the elite and often part of tribute (Staller 2010:48). Maize, beans, chia seeds, amaranth, and squash seeds were also distributed to the elite members as part of tribute (Staller 2010:55).

Traditional Spanish Foodways

A pre-Contact "normal" traditional Spanish meal for a rich family would have consisted of wheat bread, accompanied with a light touch of olive oil, meat, and red wine (Braudel 1967; Alves 1994; Earle 2012:55). In addition to these main dishes, wealthy Spaniards would generally eat a salad at the start of a meal and finish it with a desert composed of fruits, such as pears or figs, sometimes olives (Earle 2012:55). Spaniards also consumed prunes, raisins, almonds, peaches, apples, pomegranates, quince, oranges, and citrus (Pellicer 1994:116; Spores and Robles García 2007:350; Earle 2012:1). Spaniards preferred lamb, but they also appreciated chicken and beef (Earle 2012:25). Finally, honey was also a favourite for its sweet taste (Earle 2012:1). Nevertheless, not every Spaniard could afford this "Spanish" meal (Braudel 1967:101–103; Earle 2012:55–60). For the lower classes, cheaper grains, such as barley, oats and rye, replaced wheat and many people ate porridges instead of bread. Stews made out of vegetables tended to replace meat that was generally very expensive. Wine was considered essential by the Spaniards, but was watered down in order to prolong its use. Finally, commoners used olive oil only in rare occasions, as it was particularly expensive (Earle 2012:60).

As it is the case for the Mixtec people, the foods consumed vary greatly depending on the social status. While olive oil, wheat bread, red wine, and meat (lamb, chicken) were praised, not everybody could afford to eat these food items. As I will explain in the following sections, it seems that *conquistadores* and Spanish colonists had access to food items generally associated with the upper strata of the society, which might have provided the opportunity for some people to eat foods they normally would not have been able to consume in the Old World.

Importance of Food to Colonial Spaniards

Maintaining Spanish foodways became very important for Spaniards during the Early Colonial Period (Crosby 1986; Reitz 1992; Reitz and McEwan 1995; Earle 2012:1; Deagan 2015:31–32). Even the earliest documentation of Spaniards in the Americas references foodways. Columbus believed that the first colony he attempted to establish in the New World failed because he did not have access to enough Spanish food. As he wrote in his letters from his second voyage: "(…) the preservation of the health of the people will depend, under God, on their being provided with the same food that they are accustomed to in Spain: neither those who are here now, nor those that shall come, will be in a position to be of service to their Highnesses, unless they enjoy good health" (Columbus 1867 [1504]).

When Spaniards and American Indigenous people encountered each other, they were both confronted with new realities, new people, new traditions, and new cultures. In Spanish texts, we see that Spaniards had many questions about the Indigenous people they met, especially about their bodies and their personalities (Earle 2012:19). For example, Spanish writers generally described the Indigenous people as "docile", while Spaniards pictured themselves as "fierce" (Earle 2012:19). They concluded these differences were the result of the different foods they were eating (Alves 1994:64; Earle 2012:16). According to the Spanish doctors, Indigenous people had "docile" characters because of the "roots, herbs, plants, and fishes" that they were eating (Earle 2012:19). Spaniards also believed personalities and bodies were greatly influenced by the environment: the air, the water, and the climate (Earle 2012:21–22). Spaniards were thus concerned about their own health and character while in the Americas. While they could not control the American environment, they believed that controlling the foods they were eating was crucial to remain European and maintain their own identities.

Some Spaniards already believed there was a strong association between food consumption and the development of character before the Spanish colonial expansion, as seen in their folklore. Earle (2012:50–52) mentions a story where children, instead of being breast-fed, drank pigs' milk. When they became adults, they could not stop themselves from playing in mud, a character trait associated with pigs. Therefore, food was perceived as playing an important part in the creation of a person's identity and behaviour. Spaniards also believed their ability to grow beards was associated with their particular food choices, a reason they found to explain the absence of Indigenous bearded people. Without their normal diet, some Spaniards believed they might lose their facial hair (Earle 2012:24-25). As beards were closely linked with manhood and the ability to reproduce, the possibility of beard-loss was a serious matter (Earle 2012:24-25). Given these popular examples in folklore, it was no wonder that Spaniards sought to maintain similar foodways once in the vastly different region of the Americas, as necessary to maintaining health and identity.

The fear of losing their identity was not the only reason why Spaniards believed that maintaining a European diet was important. As it is possible to find in colonists' diaries, many of them had issues when eating local food. Even if presented with maize tortillas, Spaniards were puzzled as to how a meal could be eaten and enjoyed without bread. The priest Juan de Santa Gertrudis Serra wrote that "[Spaniards] did not know how to eat without bread" (de Santa Gertrudis Serra 1970:107–108; Coe 1994:27–28). The same goes with the conquistador Bernal Díaz del Castillo, who mentions, "we had hardly enough to eat. I do not speak of maize-cakes, for we had plenty of them, but of *nourishing* food [emphasis added]" (Díaz del Castillo 1963:365–367; Alves 1994:65). For Díaz del Castillo and many others, wheat bread was a key component of life and absolutely vital to maintain health. As such, new settlers endlessly worked to obtain European foods, no matter how expensive and difficult it might prove to be.

Spaniards quickly realized that producing their own food in the New World was a better solution than importing it from Europe. I have identified two main reasons to explain their will to do so. First, food did not preserve well during the long travel by ship, particularly with the lack of preservation technologies that could be used on the ships, such as metal canning and multi-locational freezing, not yet invented (Goody 1982). Wheat, an essential part of the Spanish meal, did not preserve well at all in the voyages overseas, as it "was inclined to spoil" (Earle 2012:55), The bread produced from transported wheat was hard and its colour, darker (Earle 2012:55). The taste of it must have been affected as well, although it is difficult to assess to what extent.

Perhaps most tellingly, before the Spaniards started to colonize the Oaxaca region, legislation was adopted in Spain in order to ensure the *conquistadores* would be able to maintain a Spanish diet (Earle 2012:67). The crown was obliged to provide Spaniards with "vital foodstuff", which included bread and wine. Written documents suggest that meat (lamb, chicken, beef, etc.), oil, and vinegar were also considered vital for many *conquistadores* (Earle 2012:67). The new legislation created a huge demand for these products. This leads to my second suggestion to explain why food was grown locally: significant price increases in Spain due to increased demands (Earle 2012:68).

Faced with issues of preservation, quality, and cost, transplanted Spaniards began to grow their own food in the Americas to maintain their traditional diet (Hamilton 1929; Lowery 1959:106; Farris 1984:31–32; Spores 1984:122–138; Alves 1994; Warinner 2010:236). Indeed, historical records show that Spaniards first started growing food and raising livestock in the 1490s, in "the Caribbean and the American mainland". Vines were likely cultivated as early as 1519 in the Caribbean region and wheat was probably first grown all over Mexico in 1521 (Earle 2012:69–72). As I will explain later in this chapter, wheat seems to have been introduced in the *Mixteca* region quickly after the Conquest. I believe the fact that wheat started to be grown right after the Conquest over the Aztecs (1521) demonstrates the Spanish interest to raise this crop in Mexico.

Spanish Interpretations of Mixtec Foodways

As mentioned in the previous chapter, one of the main goals of the colonization process was to evangelize the Indigenous populations (Warinner et al. 2012:467). Foodways had a critical role to play in this process. An important aspect of Catholic ritual incorporates food, including the symbolic bread and wine associated with the body and blood of Christ (Coe 1994:9). For the friars, even when these foods were consumed at home, it was still a way to connect with God and Christ, as "faith was wheat" (Earle 2012:159). The strong bond between Catholicism and wheat was also visible in Spain at that time. Even when the wheat harvests were poor between the 15th and 18th centuries, contrary to other cereals (such as barley, oath, and rye), Spaniards could not depart from this food, as it was conceived as "abandoning centuries of custom, habit, and Christianity" (Braudel 1967; Alves 1994:62–63).

Spanish friars felt strongly that diet was of central importance to Catholicism. To be considered men and women of God, Spanish friars believed that Indigenous people had to attend religious events and convert themselves, dress "properly", and change their diet to a Spanish one (Earle 2012:163). According to the Spanish friars, abandoning Mixtec foodways would help Indigenous people to be received in Heaven upon their death (Earle 2012:164).

Many Spanish observations in Colonial documents aimed to demonstrate that the Spaniards' foodways provided advantages the Mixtec diet did not have. If the Mixtecs started eating Spanish foods, they could be saved and received in heaven after their life on earth, a goal that was highly praised at that time. By modifying Mixtec foodways, Spaniards believed they could also modify their personalities and physical appearances so they could "become like the Spanish" (Earle 2012:165). One of the goals of the colonization, as mentioned earlier, was to get new subjects. Some Spaniards may have believed that modifying Mixtec foodways would be a critical path to forming Spanish subjects in the New World.

Others believed that the access to European foods should be controlled (Alves 1994:60–70). Food became a way to separate the Spaniards from the Indigenous people they encountered. Quickly, Spaniards noticed that maize was eaten by Indigenous people but could also serve to feed mules, which led them to associate eating this food item as being "brute" (Bakewell 1971:63; Alves 1994:69). Eating wheat and Iberian foods became a sign of superiority (Alves 1994:70). According to historical texts, many Indigenous elite members started eating Spanish food as a way to get closer to the Spanish culture and to demonstrate their power (Alves 1994:68). For example, Don Pedro Moctezuma, established in Tula, owned fields of wheat and maize (Alves 1994:68). Although there is plenty of historical documentation addressing the restriction of certain European foods, archaeologically, this idea still remains to be tested.

Following the multiple epidemics that started occurring in the New World, Spanish writers and colonists criticized the colonial practice of forcing Indigenous people to consume European foods (Earle 2012:172). Epidemics were devastating to Indigenous people during the Early Colonial Period. Diseases such as *pujamiento de sangre* ("abundant bleeding or full bloodiness"), possibly linked with typhus, pneumonic plague, or "a viral hemorrhagic fever" spread from Central Mexico to Guatemala, and possibly going as far as Peru (Warinner et al. 2012:480). These diseases decimated villages, sometimes wiping out entire communities. Between 1570 and 1581, the population of Yucundaa in Oaxaca declined by more than 75%, from 26,500 inhabitants to 6,522 (Warinner et al. 2012:482). Spaniards proposed different explanations for these epidemics, including foodways. Some Spaniards, such as the friar José de Acosta, believed Indigenous people became sick due to new foods they were eating, and argued that if Indigenous people returned to their traditional foods the epidemics might stop (Earle 2012:172). Gerónimo de Mendieta, a Franciscan friar, believed it was principally the introduced Spanish meats that were causing the Indigenous people to become ill (Earle 2012:172). In some locations, it is possible that Spaniards stopped forcing dietary changes to try to contain these epidemics.

Paradoxically, certain American food items quickly gained a place on tables in Europe. Beans replaced chickpeas and lentils in some dishes, peanuts and squash seeds were roasted and consumed the same way almonds were, avocado oil proved to be a cheaper alternative to olive oil, and pineapples and cocoa gained success easily with their exotic tastes (Coe 1994:28–29). Prickly pear was also introduced, although initially as a decorative plant, and only becoming a food item later (Casas and Barbera 2002:156). Maize also found its way into Spanish fields, although its introduction was quite particular. Maize was first introduced under the name “Turkish wheat”, as the plant had made its way in Spain through Turkish traders that harvested it and found it very productive (Staller and Carrasco 2010:9). Therefore, Spanish commoners thought the plant came from the Southwest Asia instead of the New World (Braudel 1967:100–103; Alves 1994:62–63; Staller and Carrasco 2010:9).

There seems to have been a debate amongst Spaniards about the idea of modifying the Indigenous foodways. At first, religious authorities believed that including wheat in the Indigenous diet was crucial, as it was a way to convert them to Catholicism (Earle 2012:159). However, it is also possible to see in the writings of Franciscan friars, following the many epidemics decimating the Indigenous population, that some of them believed the modification of the Indigenous diet might be the reason behind these deaths (Earle 2012:172). Some Spaniards also believed that modifying the Indigenous foodways would transform them into Spaniards (Earle 2012:165), while others believed maintaining distinct foodways was a way to separate themselves from the Indigenous populations (Alves 1994:60–70). In this context, I believe archaeological investigations provide another line of evidence to observe what might have happened to Achiutla foodways and to clarify our current understanding of the many conflicting ideas concerning Mixtec and Indigenous foodways.

Foodways in Colonial Times: An Historical Overview

Historical accounts from the sixteenth century tend to confirm the idea that European settlers and local Mixtecs harvested introduced crops and raised cattle in the Oaxaca region. At certain sites, such as Yucundaa, the taxation system was even based on European crops (Warinner et al. 2012:468), and for unknown reasons, wheat was taxed more heavily than maize (Alves 1994:68–69). The inclusion of wheat in the taxation system tends to support the idea that wheat and other resources were produced in the different *cacicazgos* of Oaxaca. However, archaeological data do not necessarily support this idea, as I address further on.

Historical accounts also describe the Indigenous peoples' negative opinion of stock herding (Earle 2012:160–161). During the 16th century, fields were not fenced, which allowed livestock to go nearly everywhere and eat and destroy cultivated plants, upsetting many commoners who saw parts of their fields being damaged (Earle 2012:160–161; Forde 2015:295–297). There was also a strong movement against the consumption of European animals by Indigenous people. Juan Teton, an Indigenous leader in Hidalgo, Mexico, told many locals that people eating cows, pigs, or sheep would turn them into these animals, which may have frightened some people out of eating or raising them (Ruíz Medrano 2010:68; Forde 2015:46). It is possible that this kind of message also made its way into the Mixtec discourse.

The Sierra Codex is a gold mine for information on the meals that were served during the feasts organized by the Church of Texupan. Usually, the term *codex* is used to describe pre-Hispanic documents that are written on deer hide or bark and that are displayed on "long strips" (Forde 2015:5). The Sierra Codex, written between 1550 and 1564, relates how the inhabitants of Texupan (or Tejupan) spent the communal funds (for feasts, as tribute, etc.) (Léon 1982; Forde 2015:335). The combination of written descriptions and images illustrates what was consumed during these feasts. It is because of the inclusion of traditional Mixtec pictograms that the term *codex* is used to describe this book as well. The written section describes the foods consumed, while the pictograms on the other page represent the same information. Foods present in nearly every feast include grape wine, cacao, and turkey (Figure 3.1). Wine, an essential liquid for Spaniards, was used both for feasts and during religious ceremonies. Maize is rarely written down in Spanish script, but images of maize seeds and tortillas are common, suggesting that this food was also often consumed during feasts. Cacao is only represented as seeds and the codex does not provide information about the way it was prepared and consumed. Domesticated turkeys are depicted in the vast majority of the religious feasts present in the codex. Fruits, fishes, chile peppers, domesticated poultry eggs, and shrimp are also occasionally represented in the codex. The manuscript suggests chicken and sheep were raised in Texupan, as it mentions a few times the acquisition of these animals for breeding purposes. There is also a very small presence of honey and of the wild plant *Huauzontle* (*Chenopodium nuttalliae*). As pointed out by Nicolás Léon (1982:32), *Uva silvestre*, or wild grapes, are mentioned, and may have been used to obtain vinegar. Wheat is also present in a few entries of the Sierra Codex, generally linked with consumption by the priests and the community (Figure 3.2). Although the Sierra Codex is a rich document to understand ritual foodstuffs in the Mixteca Alta, it is likely that other foods not described or illustrated were consumed during these feasts.

Figure 3.1: Wine, cocoa beans, turkey, and tortillas represented in the Sierra Codex (page 3) consumed during the celebrations of Easter 1551 (Nicolás Léon 1982)

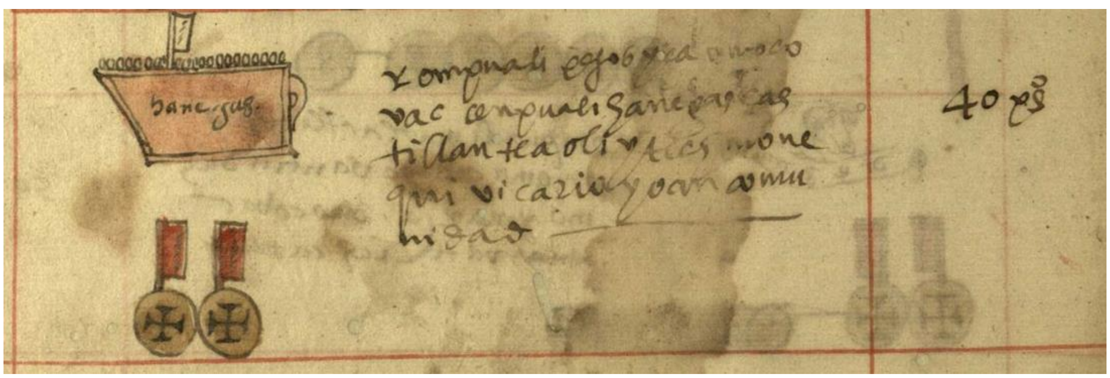


Figure 3.2: Wheat represented in the Sierra Codex in 1561 (Léon 1982)

Archaeological evidence of foodways in the Mixteca region

There is little archaeological data on Mixtec or European food consumption during the Early Colonial Period in the *Mixteca* region. While doing a study on settlement patterns at the archaeological site of Yucundaa, located in Teposcolula, Spores and Robles García did not find any European plants or animal bones associated with Mixtec households (2007:335). This led them to believe that the Mixtec "presumably" kept eating what they did previously, such as maize, beans and squash, turkey, deer, and fish when available.

When the archaeologists of the same project dug in the Dominican monastery, they also did not recover any macrobotanical residues, whether related to the Mixtec culinary tradition or the European one. Although they did not recover any food residues, they did find vessels in the monastery (Spores and Robles García 2007:348). The vessels were decorated with Mixtec iconography, yet the vessels themselves were European forms. Although we do not know the food the friars were eating, we do know they were in direct contact with the Mixtec people, as they were using plates they would not have used in Spain, a situation similar to the hybrid Puebloan chalice (Liebmann 2013) presented in Chapter 1. In this way, their dining experience was definitively transformed by the Mixtec culture, whether or not they kept eating the same foods they would have consumed in Spain.

At Yanhuitlan, during the phase associated with the Early Colonial Period, zooarchaeologists were able to identify bones from pigs, sheep/goats, cows and chickens (Spores and Robles García 2007:348–350). They also found locally-made ceramics that had a clear Spanish influence, such as olive jars. The presence of European-styled artefacts and introduced animal species by far dominated the archaeological assemblage, which led the scholars to believe that Yanhuitlan Mixtecs changed their foodways under Spanish influence, at least to a certain point. At Yucuita, carbonized wheat, peaches and prune residues were recovered in Mixtec occupation areas, although their social status was not established, which would demonstrate the incorporation of these Spanish foods into the Mixtec diet (Smith 1976; Spores and Robles García 2007:350).

To further understand potential shifts in Mixtec diet, Tina Warinner and her team (2012) found a cemetery associated with the epidemics of 1544 to 1550 in Yucundaa. They conducted isotopic analysis in order to determine if there was a shift in the Mixtec diet during the Early Colonial Period. This research was conducted on enamel and bones, which allowed the researchers to look at the long-term and short-term modifications of diet. They sampled individuals from both sexes of different ages. The results confirmed a continuity of a diet based on C4 plants (maize, amaranth, etc.). This demonstrates that Mixtecs kept a diet similar to the one they had before the arrival of Spaniards. It is possible that they ate wheat (a C3 plant), but in a very small quantity, as it did not significantly affect the isotopic signatures in the long-or short-term (Warinner et al. 2012:483).

These results may seem surprising, particularly as Spanish taxation systems at Yucundaa were based on the production of European crops, principally wheat (Warinner et al. 2012:468). Does this mean wheat was exported elsewhere or solely consumed by the Spaniards? Or were the historical accounts incorrect? The absence of Europeans foods at some sites and the presence of it at others might suggest regional variability. These fragments help us reconstitute in part what might have happened during the Early Colonial Period concerning foodways, but a paleoethnobotanical study focusing on this subject until now has not been carried out in the *Mixteca* region.

At Achiutla, bone fragments were found in two middens, one dating from the Postclassic Period, the other from the Early Colonial Period (Forde 2015:295–297). Silvia Pérez Hernández, a biologist, made the identification of the bones recovered (in Forde 2015). In the Postclassic midden, Pérez Hernández identified the presence of turkey, white-tailed deer, dog, rabbit, and birds. As mentioned earlier, these animals are associated with Mixtec traditional foodways and the presence of turkey, deer and rabbit supports the interpretation that nobles lived in the two households excavated, as these animals were normally reserved for the elite and the noble class (Spores 1967:6–8; Cook and Borah 1968:10; Houston 1983:218). In the Colonial Period midden, turkey, white-tailed deer, and rabbit were still present, with the inclusion of two bone fragments from a cow (mandible and pelvis). Unfortunately, the cow bones show a higher level of weathering than the other bones, which is probably the sign of a second deposition. Considering this information, it is impossible to link the cow bones directly to Mixtec foodways. However, it proves that cows (or at least this one) were present in the area at the time. We also know, thanks to historical documents (Forde 2015:295–297), that in 1614, inhabitants of Achiutla and Tlaxiaco lodged a legal complaint against a nearby ranch that raised sheep and goats after these animals damaged commoners' fields, demonstrating the presence of introduced animals during the Early Colonial Period at Achiutla. Historical and archaeological sources tend to demonstrate the presence of wheat at Achiutla, although it might have made its way there after the Early Colonial Period. The friar Burgoa (Burgoa 1934 [1676]:352) mentions the presence of wheat in the fields of Achiutla nearly a century after the end of the time period (1600). The presence of a wheat bread oven next to the convent in Achiutla also tends to confirm the presence of wheat in the village (Forde 2012:45-46), but it might have come later than the time period studied here.

As it is possible to see, there is a high level of variation in the amount of introduced food species found during the Early Colonial Period at Oaxaca. At Teposcolula, a village abandoned in the 1550s, even if historical texts mention that the Mixtec inhabitants harvested wheat for tribute, isotopic analysis tends to demonstrate they kept a diet very similar to their ancestors (Warinner et al. 2012). At Yanhuitlan, the ceramics styles were influenced by the European styles, while archaeologists also uncovered the presence of introduced animals (pigs, sheep/goats, cows and chickens) (Spores and Robles García 2007:348–350). At Yucuita, archaeologists found introduced plant remains of wheat, peaches, and prunes in Mixtec occupation areas (Spores and Robles García 2007:350). Finally, at Achiutla, two cow bones were found during the archaeological investigations, but they probably come from another deposit, as they show signs of erosion different than the ones found on the other bones. By examining the plants remains, it will be possible to learn more about Mixtecs foodways at Achiutla.

Assessing Foodways through Paleoethnobotany: The Last Piece of the Puzzle

My research focuses on Mixtec foodways at Achiutla prior to the arrival of the Spaniards and during the Early Colonial Period. This research directly addresses social and political dynamics that were in place during the colonial encounter. My primary goal is to complement the archaeological and historical documents reviewed in this chapter. As I have presented, Europeans had strong opinions about Mixtec foodways and, in some cases, worked to change them. At this time, we only have the Spanish perspective; we can only guess what Mixtecs thought of Spanish foodways, and their response to the pressures to change their foodways and to produce European crops. By studying what foods Mixtecs consumed through direct botanical proxies, I address how they reacted in their everyday life towards a new political reality. Paloethnobotanical research also provides the opportunity to look at Mixtec foodways during the Postclassic Period and compare results with the other research in the region. This grants a better view of the dynamics that existed in the region and help determine to what extent the foods consumed in the different *cacicazgos* stayed the same, or changed under Spanish influence.

Europeans believed they had many reasons for modifying Mixtec foodways, but not every Spaniard shared this goal, particularly during the epidemics. It is difficult to assess to what extent Spaniards pushed to modify Mixtec foodways, each *cacicazgo* having its own story. With the Spaniards already trying to modify Mixtec culture (such as religious beliefs), foodways were likely another step in solidifying their power. The Mixtecs likely resisted, just as they did peacefully in their households or publicly through revolts, arrests, and trials throughout the Early Colonial Period. We currently know very little about the everyday life of the Mixtecs. By looking at what plant foods they ate, I will be able to determine to what extent they resisted, negotiated, or accepted Spanish cultural elements into their own diet.

Chapter 4: Methodology

In this chapter, I describe the protocols followed during the analysis of the macrobotanical and microbotanical samples. I first introduce the concept of paleoethnobotany, and then explain how Jamie Forde and his team selected and collected the paleoethnobotanical samples at San Miguel Achiutla. I follow with a summary of the methodology used in other macrobotanical studies before describing how I analyzed and identified the macrobotanical remains. I complete this chapter by describing the general process necessary to prepare and anlayze microbotanical samples. I conclude by describing the methodology I followed in my own research.

Paleoethnonotany is the study of ancient plant remains in association with human activities and culture (Albarella 2001:9; Wilkinson and Stevens 2008:15). Such research includes the study of macrobotanical remains (seeds) and microbotanical remains (phytoliths and starch grains). This type of analysis takes time and can prove to be expensive, as the recovery and analysis need to take into account the "small size and the fragility of the remains" (Lennstrom and Hastorf 1992:205). By combining macrobotanical and microbotanical studies together, the limitations of a single method are overcome and complementary and corroborative results are possible (Pearsall et al. 2004:423–424). The conditions of preservation (soil, erosion, climate, etc.) affect the visibility of certain paleoethnobotanical residues, but by studying three different types of botanical remains, there are more opportunities to retrieve and identify plants associated with human consumption.

As previously described, my core goal in this research was to identify plants that were included in Mixtec foodways at Achiutla. Paleoethnobotanical techniques are often used to identify plants that played a role in Indigenous diets (Pearsall et al. 2004; McCafferty 2008; Mickleburgh and Pagán-Jiménez 2012; VanDerwaker and Kruger 2012:518; Morell-Hart et al. 2014), but these techniques can also serve other purposes, such as reconstructing ancient environments (Asouti and Austin 2005; Urrego et al. 2009).

By focusing my research in two households, I targeted contexts associated with daily human activities, and results associated with food plants. I combine macrobotanical samples that come from households with artifacts that are likely associated with food production, including grinding stones that could have been used to process maize, ceramics that could have been used during meals, and obsidian blades that might have served to process squash and other foodstuffs. My research thus targets daily activities to find edible plants generally linked with human consumption and Mixtec or Spanish foodways.

Foodways plays an active role in everyday and ritual life (Hastorf 1991; Van der Veen 2003), and can inform us about cultures, social structures and the political sphere (Evans 2003; Morell-Hart 2011; Morehart and Morell-Hart 2013:19). Paleoethnobotanical studies targeting foodways related to Colonial contexts have demonstrated the potential and the importance of this approach when studying cultural encounters. The analysis of plant remains from Egyptian Red Sea ports during the Roman and the Islamic Periods (Van der Veen and Morales 2017) enabled archaeologists to understand better the commercial dynamics involved in the spice trade, including the time period where certain species started to spread around the world. This research also provided information on the foodways of the people living and working in the ports. A study of Québec City from the French Colonial Period, 1535 up to 1900, explored the relation between its inhabitants and plants, including the evolving concept of "wilderness" (Bouchard-Perron 2017). Given this success in other geographic regions, paleoethnobotany is a good route to study how Mixtec people carried on in their households following the Spanish Conquest.

Paleoethnobotany is a great way to learn about past societies' foodways. At Los Naranjos, Honduras, a study combining macrobotanical, microbotanical, and pollen analysis of residues dating from the Middle Formative Period (1000–500 BC) focused on ancient human diet and plant management (Morell-Hart, et al. 2014). Before this research, it was believed that maize became an important food item in 800 BC, based on the identification of maize remains elsewhere in the region and the apparition of great amounts of charcoal during that time period, believed to be linked with great episodes of deforestation (Morell-Hart et al. 2014:67). This microcharcoal and the pollen residues were used as markers of agriculture using the slash and burn technique. However, the study demonstrated that this assumption should be "reconsidered" (Morell-Hart et al. 2014:66–67), as the macrobotanical analysis only led to the identification of one maize kernel, while other wild plants and roots were identified at the site using starch grains and phytoliths.

While studying at San Carlos Homestead, Vercacruz, Mexico, VanDerwaker and Kruger (2012) obtained completely different results. In this study of Early and Middle Formative Periods (1500–400 BC), maize was the "most abundant" species identified (VanDerwaker and Kruger 2012:518). Other plants (sapote, avocado, and coyol) were also common at the site, demonstrating the inclusion of other plants in the local diet. This study demonstrates that, during the same time period, archaeologists can expect great variability in food consumption and should focus on regional data.

George McCafferty (2008) studied macrobotanical plant remains in Santa Isabel, Nicaragua, during the Early Postclassic Period (800–1250 AD). The preservation of plants and bones was great, but the amount of plant species was very low compared to fish and other animals, which led McCafferty (2008:78) to believe that their foodways were probably based on fish and other species, with the inclusion of wild plants, such as the *jocote*. We can see that macrobotanical studies can identify the presence of crops and wild resources in foodways and, when compared with zooarchaeological data, it can provide a better understanding of the local diet.

Paleoethnobotanical Samples Collection

Jamie Forde and his team, following a protocol elaborated in partnership with Shanti Morell-Hart, collected all the macrobotanical and microbotanical samples in 2013 at Achiutla (Forde 2015:132–133). The samples were then exported to the McMaster Paleoethnobotanical Research Facility (MPERF) with the authorization of the *Instituto Nacional de Antropología e Historia* (INAH). I analyzed 21 macrobotanical samples and 5 microbotanical samples. Michelle Gorman, an undergraduate student, partially analyzed one other macrobotanical sample (FS 779) as part of an undergraduate report. I completed the analysis of the sample and included the results in this research, which puts the total number of macrobotanical samples analyzed at 22.

At the site Jamie Forde (Forde 2015; 2017a) and his team created a grid of 1 m units. Every one out of four units was bulk sampled for flotation, in order to obtain macrobotanical residues. In selected units, ten liters of sediment were taken for every vertical lot encountered. Every lot was collected, even the surface, in order to provide a full understanding of the ecology of the site, and possibly identify contemporary contaminants. Smaller sediment samples were collected when the lots did not have enough sediment, and additional samples were taken when promising features were identified. The units were placed every four metres along the east—west and north—south baselines, giving access to zones outside of the excavation area in order to provide more information on the site.

This way of sampling provided the opportunity to study many different archaeological contexts and complement the archaeological hypotheses elaborated by the researchers, namely the use of obsidian tools. Given that it is hard for archaeologists to identify seeds *in situ* during excavation, as certain seeds such as tobacco, measure less than 500 µm, bulk flotation provides a way to distill archaeological seeds and ensure maximum recovery. By sampling systematically one of four units, archaeological contexts where seeds have been missed while digging might still be examined, leading to new results. As paleoethnobotany is time consuming, it would have been impossible to analyze every unit encountered. This is why the data collection had to be limited to one out of four lots. However, Jamie Forde and his team did collect additional soil samples when they encountered what they believed to be promising features.

The bulk sediment samples were processed at the laboratory of San Miguel Achiutla. First, 250 mL of sediment was taken away from every sample for future microbotanical analysis. The remaining sediment was placed in a flotation machine (Figure 4.1) designed by Rob Cuthrell, following the SMAP machine designed by Deborah Pearsall, and later modified by Shanti Morell-Hart (Morell-Hart 2015). Before the process began, 100 mL of detergent was added in the mix to disintegrate the clay. The machine was then agitated by water in order to separate the floating organic materials (light fraction) from the sediment (heavy fraction). The heavy fraction was inspected on-site in order to collect the artifacts. The light fractions were bagged and sent to McMaster University.

Figure 4. 1 : Flotation machine used at Achiutla

Artifacts were also collected for microbotanical residue analysis. A series of 24 lithic and ceramic objects were collected and packed unwashed in individual bags. The selection of these objects was made to represent the artifacts found during the excavations at Achiutla and ranged from the Postclassic Period to the Colonial Period and later.

All the archaeological contexts investigated in this research have been attributed a relative date based primarily on ceramic data (Forde 2017b). As there is no C14 dating right now, all the dates obtained and used in this research are probable (Forde 2017b). Once again, given the amount of time needed for paleoethnobotanical analysis, archaeologists had to limit the number of artifacts collected for residue analysis. As I explain later, I also subsampled from the set of artifacts collected by Jamie Forde and his team, as logistical constraints limited the microbotanical analysis to a sample of five artifacts.

Macrobotanical Analysis

Macrobotanical analysis consists of the identification of organic fragments recovered in archaeological soil that necessitates a low magnification range (generally up to 50 X). It mostly consists of wood, charcoals, seeds, dried fruits, and non-diagnostic fragmented parts of fruits, seeds and tubers, called lumps. Before describing the methodology I followed in the course of this analysis, I summarize the general process followed in macrobotanical research using five studies (Drass 1993; Ward 1998; Ross and Zutter 2007; VanDerwarker and Kruger 2012; Morell-Hart et al. 2014).

In order to analyze macrobotanical remains, archaeologists need to collect soil samples. Depending on the resources, the time, and the research questions, the number of samples can vary greatly. Morell-Hart, Joyce and Henderson (2014:70) collected soil samples from every locus encountered, before making a selection of samples in the laboratory, after having evaluated their potential. VanDerwarker and Kruger (2012:514–515) collected samples in every feature and context identified and selected the ones associated with the time period they were studying. Ward (1998:167) and Drass (1993:53) collected samples when they judged the context interesting for macrobotanical studies, while Ross and Zutter (2007:65) targeted the rich areas of middens only. The amount of soil recovered also varies, from 1 litre (Ross and Zutter 2007:65) to 4 liters (VanDerwarker and Kruger 2012:515), depending on the region, the soil, time, and resources once again. Usually, the soil recovered is then placed in a flotation device (Drass 1993:54; Ward 1998:167; VanDerwarker and Kruger 2012:515; Morell-Hart et al. 2014:70). A sieve is generally inserted in the machine, which is filled of water. By placing the soil in the machine and slowly agitating it, the soil will sink at the bottom and the botanical material will float to the surface, which can be collected using the sieve, separating the organic part (light fraction) from the generally inorganic one (heavy fraction).

Once the light fraction is collected, it can be analyzed using a binocular microscope (VanDerwarker and Kruger 2012:515; Morell-Hart et al. 2014:70). The seeds are identified using "the size, the shape […] the surface patterning, and other related morphological characteristics" (Morell-Hart et al. 2014:70). Books and reference collections are often used to help in the identification process (VanDerwarker and Kruger 2012:515; Morell-Hart et al. 2014:70). Once the seeds are identified, they are generally stored properly with clear identification tags (Morell-Hart et al. 2014:70).

My research focused almost entirely on the seeds encountered under the microscope. Before being analyzed, all the light fraction samples were weighed, using an electronic scale. Then, they went through a sieve in order to simplify the microscopic analysis. The sieve sizes were 4.75 mm, 2 mm, 1 mm, and 500 µm. The five different sizes obtained were bagged separately before eventually sorted in a Petri dish, where I looked at them using an *AmScope* binocular stereoscopic reflected light microscope with a 5—40X magnification.

Three types of botanical remains were recovered during this analysis. Carbonized lumps of plants were collected, but not identified. Dried fruits and seeds were recovered using tweezers and a small brush and placed in identified small empty capsules. All the seeds and dried fruits were then photographed using the *ToupLite* software. When encountered during the sorting process, artifacts were taken out of the samples, photographed, identified and stored properly. For potential future analysis, charcoal fragments of more than 2 mm were recovered and counted in every sample up to a maximum of a 1000. Insects and shells of more than 2 mm were also recovered and put in small empty capsules.

Seeds were identified using books (Martin and Barkley 1961; Barthlott et al. 2000; Rios et al. 2004; Lentz and Dickau 2005; Cornejo and Janovec 2010; Ibarra-Manríquez et al. 2015; Valdés Reyna 2015), the McMaster Paleoethnobotanical Research Facility

(MPERF) reference collection, and online seed databases (Department of Horticulture and Crop Science, The Ohio State University; Jardín Botánico Nacional, Viña del Mar, Chile; United States Department of Agriculture; United States Department of Agriculture, Agriculture Research Service). I also visited the archaeological site of Achiutla in 2016 to familiarize myself with the local flora. It was helpful to visit the site and identify contemporary plants present on the excavated terraces and nearby. I also visited the *Jardín Etnobotánico de Oaxaca* and their library at multiple times in order to familiarize myself with local plants and with the different traditional uses associated with them (foodways, medicine, textile production, etc.). During my research, I had access to a reference collection reaching over 2000 species, while it is estimated that there are currently over 9000 in Oaxaca (García-Mendoza and Meave del Castillo 2011), thus explaining my inability to identify certain taxa.

Microbotanical Analysis

In microbotanical analysis, I included the study of phytoliths and starch grains. Phytoliths are silica bodies that come from plants that can be retrieved in soils, on artifacts, in teeth calculus, and in coprolites (Pearsall 2015:253). They are an excellent way to study foodways when organic materials do not preserve well, as phytoliths are inorganic (Pearsall 2015:253). The understanding and identification of diagnostic phytoliths is getting better worldwide (Pearsall 2015:253), but many phytoliths remain unknown or non-diagnostic.

Starch grains are a chemical compound made of polymers and sugar (D-glucose) (Pearsall 2015:341). They are essential in plants, their main function being to store energy

(Pearsall 2015:342). Starch does not preserve well with heat, which unfortunately limits its identification in certain contexts where the sediment or artifacts analyzed were exposed to heat (i.e. cooking vessels, fire pits).

Combining the analysis of phytoliths and starch grains provides a better understanding of foodways and plant management, as it can compensate the fact that certain plants do not produce diagnostic phytoliths, while others do not produce diagnostic starch grains. By identifying both phytoliths and starch grains, it is possible to get a better understanding of the full array of plants that were directly associated with the artifacts analyzed and to identify artifacts that were exposed to heat.

In order to be analyzed, microbotanical remains have to be extracted and then prepared for the microscope. When extracting microbotanical remains from artifacts, it is recommended to proceed in different steps, as the starch grains found in the soil along with the artifact generally differ from the ones found in "pores and crevices of artifacts" (Atchinson and Fullagar 1998; Morell-Hart et al. 2014:72). Therefore, by proceeding in different steps, we are able to differentiate the microbotanical residues coming from the soil matrix from the ones coming from the artifact that are likely linked with its use. Generally, paleoethnobotanists proceed in three steps, the dry wash, wet wash, and sonicated wash (Pearsall et al. 2004:427–428; Logan et al. 2012:240).

The first dry wash consists of gently rubbing the artifact to collect the dirt still stuck to it (Pearsall et al. 2004:427–428; Logan et al. 2012:240). In order to avoid contamination, paleoethnobotanists have to wear clean powder free gloves and use clean sterilized tools (Pearsall et al. 2004:427; Mickleburgh and Pagán-Jiménez 2012:2471;

Morell-Hart et al. 2014:72–73). The dirt is then collected and stored, often in centrifuge tubes. This wash is a way to collect microbotanical remains from the adhering dirt and the artifact, which can be useful to understand the environment in which it was preserved. It is also a way to assess other potentially used plants discarded in the vicinity of the studied artifact.

The wet wash adds the use of distilled water (Pearsall et al. 2004:427; Mickleburgh and Pagán-Jiménez 2012:2471; Morell-Hart et al. 2014:72–73). Distilled water is poured on targeted surfaces, which are believed to be holding the best potential (Logan et al. 2012:240). While pouring distilled water and gently rubbing the dirt from the artifact, the dirt is collected using a clean pipette. This process extracts dirt from the crevices of the artifacts, meaning the results obtained are more likely associated with the use of the artifact, but also contain some material from the surrounding matrices. This wash allows the "tracking" between surrounding matrices and artifact use.

The final wash, the sonicated wash, uses sound waves in order to dislodge the dirt from the deepest crevices and its results are most likely associated with the use of the artifact (Pearsall et al. 2004:427; Mickleburgh and Pagán-Jiménez 2012:2471; Morell-Hart et al. 2014:72–73). The dry wash provides a general idea of the microbotanical remains present in the archaeological, but it is also a wash that can inform us about the use of the artifacts. Pearsall et al. (2014:434–436) found that maize cob phytoliths could be found more easily in the dry and the wet wash, while the sonicated wash tended to show more maize starch grains. Therefore, it is important to study the three washes altogether.

Once the three microbotanical extractions have been performed, the remains collected are mounted on glass thin slides and then analyzed using a 100-1000x transmitted light microscope with polarizing light (Del P. Babot 2001:70; Mickleburgh and Pagán-Jiménez 2012:2471). As with the macrobotanical samples, the archaeological residues can then be compared with modern reference collections.

The microbotanical analysis done in this research focused on phytoliths and starch grains recovered from 5 artifacts: two *piedras de moler* (grinding stone), two obsidian blades, and one *majolica* ceramic sherd (see Table 4.1 and Figure 4.2). I selected two artifacts that were likely used for food preparation, as grinding stones are very often used to grind maize kernels to prepare porridges or tortillas (Wetterstrom 1986: 15; Brumfield 1991: 239; Beck 2001: 189; Stross 2006). I selected two obsidian blades, as Jamie Forde's research focused on this subject (Forde 2015; 2017a) and prior studies demonstrated general high recovery rates from these blades (Morell-Hart et al. 2014). Finally, I selected one ceramic fragment associated with the Colonial Period, in order to compare the microbotanical results coming from the Postclassic and the Early Colonial Periods.

Table 4. 1: Five microbotanical samples analyzed

Type of artifacts	FS #	Probable dates	Terrace	Archaeological context
Grinding stone	3184	UNK	10	Slopewash
Grinding stone	55	Colonial	10	Colonial midden
Obsidian blade	124	Colonial	10	Colonial midden
Obsidian blade	3171.1	Postclassic	10	Postclassic midden
Majolica ceramic sherd	1584	Colonial	13	Ash pit

Figure 4. 2**: Extracted artifacts (FS 3184, 55, 124, 1371.1, and 1584)**

Extraction of the Microbotanical Materials

The microbotanical remains were extracted following a procedure elaborated by Shanti Morell-Hart in 2015. Each artifact was washed three times in order to obtain a total of 15 samples. Before starting the extraction, I labelled three centrifuge tubes per artifact, including provenience (name of the archaeological project, sample number given on-site, and a description of the artifact), microbotanical analysis sample number, and the type of wash. Once the tubes were all labelled, I cleaned the table and the material I was going to use. The table was washed using tap water. Then, I placed brown towel paper and kim wipes on top of it. As mentioned by Morell-Hart (2015), the brown towel paper protects the artifact from the workstation contamination, and the low powder kim wipes do the same for the brown towel paper. Before each wash, I used a Petri dish that was first cleaned with soap, rinsed with tap water and then rinsed with distilled water. For each different wash, I wore new powder-free gloves, used a clean Petri dish, and I regularly changed the brown towel paper and the kim wipes disposed on the table.

As mentioned before, artifacts were washed three times. The first dry wash consisted of gently rubbing the targeted surface of the artifact in order to detach the dirt (and the microbotanical materials) stuck on it. I focused on the interior surface of the ceramic sherd and the distinctive used sections of the grinding stones. For the obsidian blades, all the surfaces were dry washed. The artifact was held over the clean Petri dish and the dirt was directed into it. Once no visible material was coming off of the artifact, I collected the dirt that fell into the Petri dish and moved it into the labelled centrifuge tube. When the uncovered material was not big enough to be transferred easily, I added distilled water in the Petri dish and used a new pipette to transfer it. Once the dry wash was completed and the uncovered material was placed in the centrifuge tube, I cleaned the other surfaces of the artifacts in order to avoid potential contamination for the next two washes. Once all done, I placed the artifact in a new, clean Petri dish, discarded the old gloves and the used pipette. For the cleaning of the giant *piedra de moler* (FS 3184, Microbot 1), Sophie Reilly, a graduate student in the MPERF, aided me in holding it, as it was too difficult to handle due to its size.

Before starting the second wash, the wet wash, I put on new powder free gloves and prepared a pipette just before starting the process in order to avoid contamination. With the artifact still in the new Petri dish, I started pouring a bit of distilled water and then started rubbing the wet area with my gloved finger in order to obtain the dirt that was still stuck on the artifact and inside its pores. Using a clean pipette, I collected the dirt mixed with water that was obtained in the process and put it in the labelled centrifuge tube. After finishing, I followed the same process as before: cleaning all the other surfaces of the artifact, putting the artifact in a clean Petri dish, and throwing away the used pipette and gloves.

For the last wash, the sonicated wash, I put new gloves on, prepared a pipette and used a clean *Labelle* hand-held sonication device (30, 000 Hz per second). The sonication machine was cleaned the same way as with the Petri dishes: with soap, tap water, and then rinsed with distilled water. I then put a small amount of distilled water on the artifact's selected surface and started agitating the aqueous solution, using the sonicator. I used the device for five minutes on each artifact, collecting water mixed with small particles throughout the process and transferring the residue into the centrifuge tube, using a new pipette. Once the sonicated wash was completed, the artifact was left to dry and I cleaned all the material for the next sample to be processed.

Microscope Preparation and Identification

The microbotanical samples obtained from the three washes were mounted on glass slides and analyzed using a ZEISS polarizing transmitting light microscope at 400 X. Before starting the process of converting the recovered samples into thin slides, I cleaned the table, using tap water and created a layer of brown towel paper before putting on a few kim wipes on top. Then, putting on clean powder free gloves, I prepared a new pipette and opened one of the centrifuge tubes. I then took a clean thin slide from its manufactured box and, using the pipette, I started agitating the microbotanical sample in order to obtain a mix of water and residue. Once satisfied with the mix obtained, I deposited two drops of the microbotanical sample on the thin slide. Then, I carefully put a new cover slide on the top of the two drops. In order to seal the slide, I used purple nail polish that I displayed all around the cover slide before letting it dry. I made two slides of every wash that I clearly identified using the provenience (name of the archaeological project, sample number given on-site, and description of the artifact), the microbotanical analysis sample number attributed, the type of wash, and the slide number.

I then viewed each slide under the Zeiss microscope at 400x, taking pictures using the *ZEISS* software. In order to identify the phytoliths and the starch grains I found, I used books and articles (Pearsall and Piperno 1993; Piperno and Holst 1998; Ball et al. 1999; Piperno 2006; Torrence and Barton 2006; Duncan et al. 2009), the MPERF reference collection, and online resources (Pearsall et al. 2006). I also collected plant specimens linked with traditional Mixtec (squash, maize, etc.) and Spanish foodways (wheat, oats, peaches, etc.) from markets located in Toronto, Ontario, and studied them under the microscope.

Paleoethnobotany is a helpful approach that provides the opportunity to study daily activities that are directly linked with questions of identity (Fox 2002:2; Dietler 2006:218; Hastorf and Weismantel 2007:308; Panich 2013:105). As I explained earlier, the limited amount of historical, archaeological, and ethnohistorical data about Achiutla limit our current understanding of Mixtec daily lives and of the dynamics in place during the Early Colonial Period. As they saw their political and religious traditions being transformed by the Spanish Colonial authorities, it is possible Mixtec made great efforts to ensure the persistence of their culture at home. It is also possible that the Spaniards encouraged the Mixtecs to include new foods in their diet, including wheat. By selecting samples from the Postclassic and the Early Colonial Period, I was able to observe the continuities and differences in the occupants of Terraces 10 and 13's diets. By combining macrobotanical and microbotanical data, I can examining three plants remains (seeds, phytoliths, and starch grains) that, when examined together, have the potential to fairly represent the Mixtec foodways at the time. The results of the study are presented in the next chapter, while the interpretations of the results are in Chapter 6.

Chapter 5: Identification of Plant Remains at Achiutla

In order to determine how the Mixtecs of Achiutla negotiated the arrival of the Spanish authorities in their village, I decided to explore their everyday lives through foodways. By analyzing 27 paleoethnobotanical samples, my goal is to determine to what extent the occupants of Terraces 10 and 13 (Figure 5.1) negotiated, incorporated or resisted newly introduced plant species in their diet. I present the results I obtained in this chapter. I first introduce these two terraces and their main structures and features. I follow with the macrobotanical results from the bulk flotation sediments and conclude this chapter with results from microbotanical analyses of artifacts recovered from these two locations. I interpret the results in the following chapter.

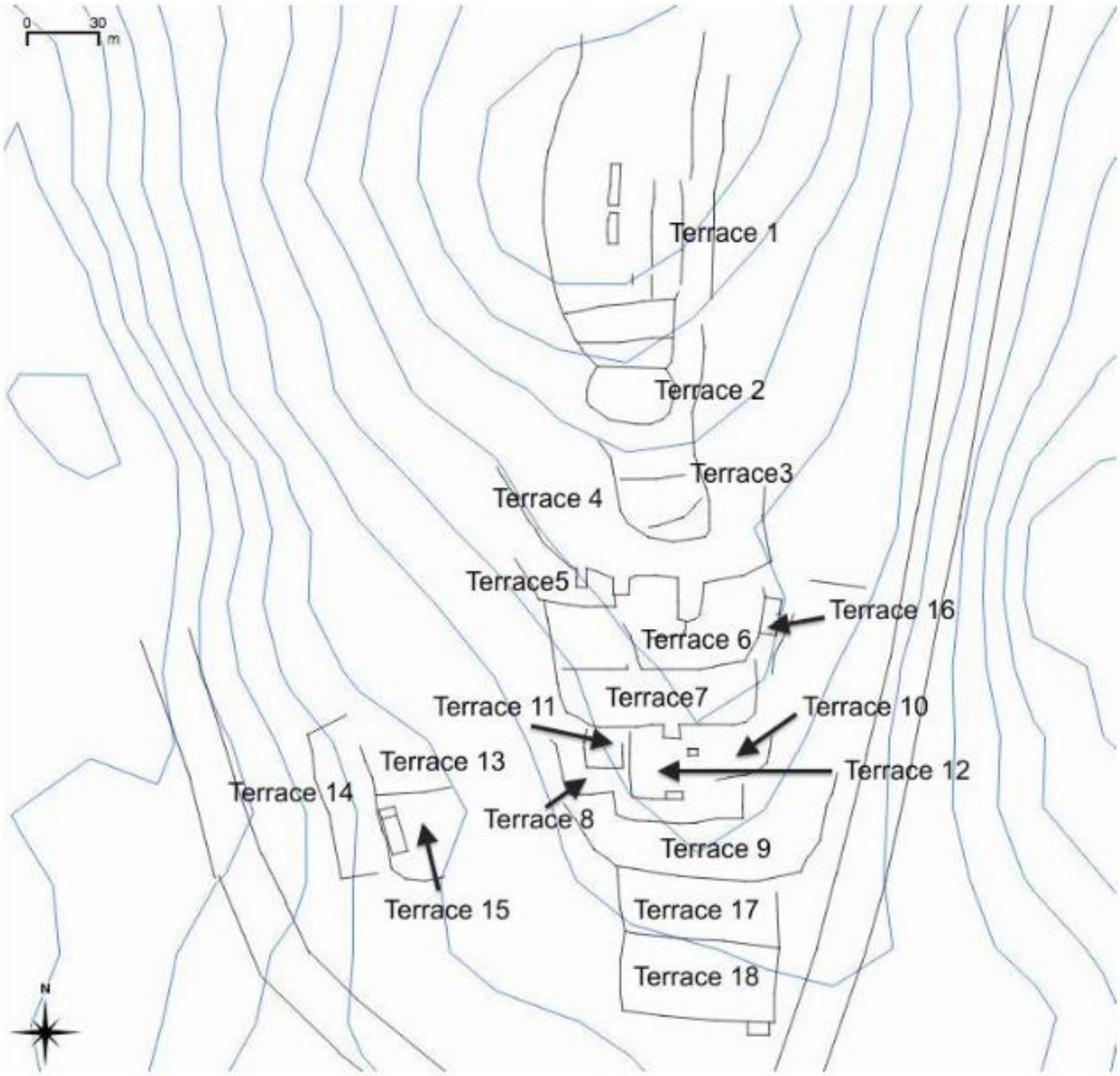


Figure 5. 1: Location of Terraces at Achiutla (Forde 2015:92)

Terraces 10 and 13

In 2013, Jamie Forde (2015; 2017a) and his team focused their archaeological investigations primarily at Terraces 10 and 13. As mentioned earlier, noble families probably occupied them both, the one living at Terrace 10 being probably of a higher status than the one living at Terrace 13 (Forde 2015:171). They are both located on the North Side of the *Pueblo Viejo* of Achiutla.

Terrace 13 North

This terrace is located right under the "monumental terraces" found in the West sector (Forde 2015:126). Two walls delimit the terrace on the West and the South sides (Forde 2015:161). During archaeological excavations, a total area of 112 m^2 was opened in a series of 1x1m units, with some units measuring 2x1m and 2x2m, depending on the archaeological context uncovered (Forde 2015:129, 163). The terrace was mainly occupied during the Postclassic and Colonial Periods, the latter showing the most signs of occupation based on the number of artifacts and architectural elements identified. This terrace was also probably abandoned during the Colonial Period (Forde 2015:163, 169).

Four different strata have been observed at Terrace 13 (Forde 2015:164–168) and four main structures have been identified (Forde 2015:171–175). Structure 1 is believed to have been a "large residential building" occupied for a short period of time during the Early Colonial Period and probably built after the arrival of Spaniards in the region (Forde 2015:171–173). As mentioned earlier, the architecture of this structure is less elaborated than at Terrace 10, which led Forde to believe that its occupants were nobles of lower status or rich commoners (2015:171). Structure 2 probably dates to the Late Postclassic Period and is located near Structure 1 (Forde 2015:173). Its functions are still unknown. Structure 3 might have served as an altar during either time period, although poor preservation makes it hard to fully understand (Forde 2015:174). The last feature uncovered was a drain that is probably more recent than the Early Colonial occupation of Terrace 13 (Forde 2015:175–176).

Archaeologists have also identified an interesting feature at this terrace: Feature 21, an "intrusive ash pit" (Forde 2015:176–179). It seems to have been excavated during the Early Colonial Period and then filled mostly with ash. Because there was a limited amount if refuse in it, Jamie Forde believes it was not designed as a midden, but was rather associated with an activity involving the creation of a great quantity of ash. It could have been linked with the processing of lead, a material that was found on the terrace in an interesting quantity. The presence of the lead concentrations led Jamie Forde to believe that nobles occupied Terrace 13, rather than commoners, due to the organization of craft production that was present at the time (Forde 2015:181–182).

Terrace 10 North

This terrace is located right in the centre of the monumental sector of the *Pueblo Viejo* (Forde 2015:126). It was the biggest excavation of the project, covering a total area of 178.5 m^2 following the same units of dimensions as at Terrace 13 North (Forde 2015:129, 188). During the archaeological excavations, nine "principal strata" were identified (Forde 2015:189). The artifacts recovered mostly date to the Postclassic and Colonial Periods. Terrace 10 was probably constructed during the Postclassic Period and occupied from then until its abandonment, which likely occurred around a century after the 1521 Conquest (Forde 2015:198, 235).

The main architectural structure in this terrace is a "complex of four buildings surrounding a central patio" (Forde 2015:199), which is accompanied by a large "corridor" to the west. As mentioned previously, the architecture is more monumental than at Terrace 13, which makes Forde (2015:235) believe that high nobles occupied

Terrace 10. On the patio, archaeologists uncovered an interesting feature (Feature 44), a ring of 1.7 m in diameter composed of thin stones (Forde 2015:214–219). Inside the circle, excavators found a great amount of obsidian debitage. To explain this discovery, Forde believes that obsidian knapping probably occurred on the patio and that people might have discarded their unused flake material in the feature (Forde 2015:216). The function of this circle remains difficult to assess. According to Forde, it could "at least [be] possible that Feature 44 was used […] for drainage" (2015:216). However, Forde also suggests that, because there are no similar pre-Hispanic structures known as of today, it could be an architectural trait inspired by a European religious one (2015:217–218). It could have been a way for the Mixtec occupants to build "their homes as sacred spaces" (Forde 2015:217–218).

Terrace 1 South

At the end of the macrobotanical results, I will present the results of one sample coming from Terrace 1 South. This Terrace is the "highest and northernmost of the residential terraces" of Achiutla's *Pueblo Viejo* (Forde 2015:137). According to Forde (2015) it has a short wall delimiting part of its south side and it covers a smaller area than the terraces below it. Based on the level of artifacts recovered, he believes it to have been a residential terrace. Artifacts from the surface likely dated from the Postclassic Period, but archaeologists found artifacts probably dating as early as the Formative Period (1500 BC—300 AD). Jamie Forde (2015) decided to stop the archaeological investigation and preserve this terrace for future excavations, as his research questions focused on the Postclassic and Early Colonial Periods. I received one sample coming from Terrace 1

South and I analyzed it, using it as a way to study the plant remains associated with the pre-Hispanic occupation of the terraces.

Macrobotanical Results

The bulk flotation sediments collected during excavations of the two terraces yielded 261 macrobotanical remains and 33 taxa, from 22 samples. I present the results of this analysis starting with Terrace 13, followed by Terrace 10. I end this section by combining the results of the analyses of both terraces and include one sample analyzed from Terrace 1 to obtain a broader view of the plants identified at the *Pueblo Viejo* of San Miguel Achiutla.

Terrace 13 North

I analyzed five macrobotanical samples obtained from Terrace 13 North. Table 5.1 indicates their provenience, and refers to their samples numbers (FS), which I will use throughout the text. The table also indicates the weight of each light fraction before analysis, the number of charcoal fragments that were bigger than 2 mm, and general shell quantity, on a scale of 0 (absent) to 3 (highly present). Finally, it indicates the nature of the artefacts recovered in the light fraction with the following code: *c* indicates ceramic sherds, *l* indicates lithic tools and debitage, and *z* indicates the presence of zooarchaeological remains. Artifacts recovered during the analysis of the light fraction were not analyzed in this research.

Table 5. 1: Provenance and information about Terrace 13 North

Archaeological context	FS Number	Weight (g)	Charcoal > 2 mm	Shells (0–3)	Artefacts*
N T13 15M L5	2755	46,8664	149	1	
N T13 15M L7	2759	49,7053	95	3	
N T13 16N L3	1022	36,9065	16	1	c
N T13 18H L2	2893	17,967	294		
N T13 5K L4	1322	51,0694	405		

*c= ceramic sherds, l = lithic debitage, z = zooarchaeological remains

FS 2755

This macrobotanical sample is one of the three (with FS 2759 and 1022) that come from the ash pit mentioned earlier (Feature 21). The likely date for these three samples is "Colonial or later" (Forde 2017b). I identified three charred seeds in the light fraction. The first one comes from Astereceae, *Madia sativa*. The second one has been identified as Unknown 1 (UNK1) (Figure 5.2). It is ovoid and measures between 1 and 2 mm and is similar to the Urticaceae, *Cecropia obtusifolia* depicted on page 308 in Ibarra-Manríquez et al. (2015). However, the surface of UNK1 is smooth and does not correspond at all to the *Cecropia* sp.'s distinct one. The last seed is also unknown (UNK2) (Figure 5.3). It is ovoid as well, but its surface and size did not match any seed I encountered in the different databases I investigated.

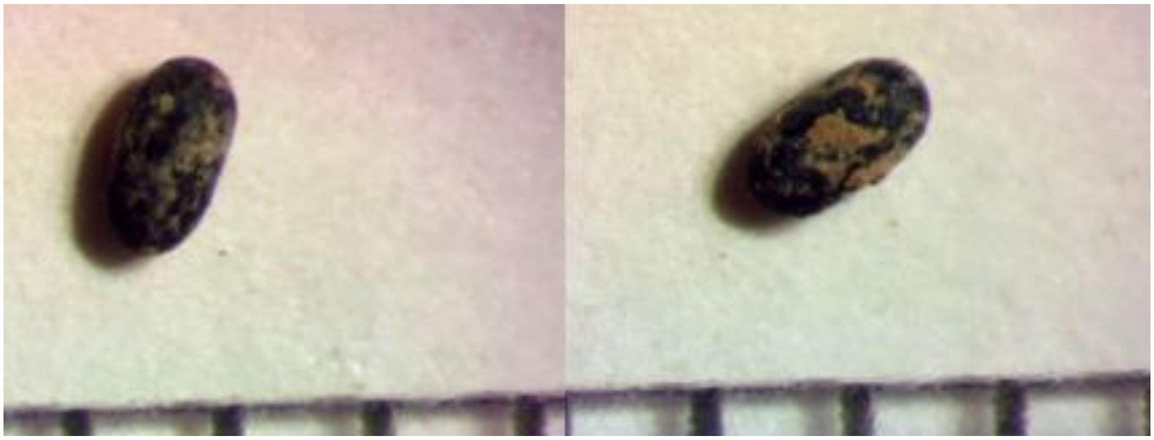


Figure 5. 2: UNK 1

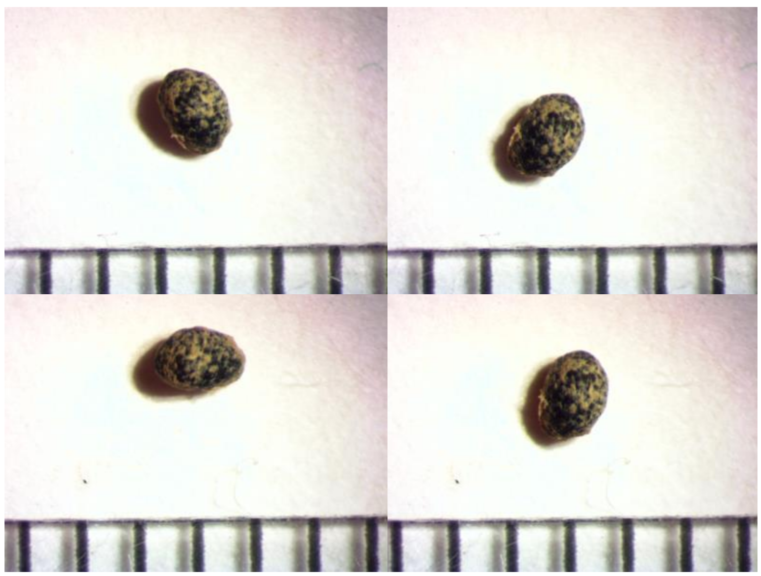


Figure 5. 3: UNK 2

FS 2759

In this sample, I identified three charred seeds as well. The first one comes from Astereceae, *Madia sativa* (Figure 5.4). The second one is a Chenopodiaceae, *Chenopodium* sp. and the third one is an unknown (UNK3) (Figure 5.5). UNK3 has a surface very similar with seeds in the Malvaceae family, but I was not sure enough to tentatively assign the seed to this family.

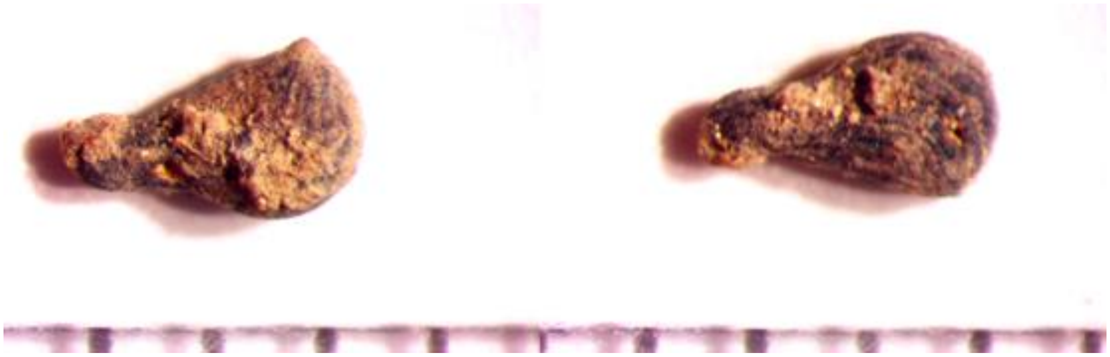


Figure 5. 4: Astereceae, *Madia sativa*

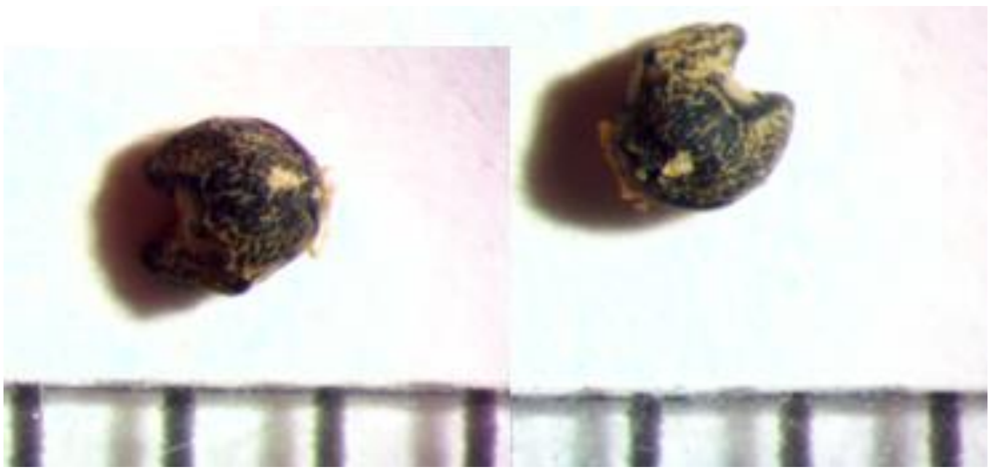


Figure 5. 5: UNK 3

FS 1022

This is the last sample coming from Feature 21. There were no charred botanical remains in the >4.75 mm size, and just a few in the >2 mm fraction. In this sample, I found two charred seeds and one non-charred. I also encountered a small ceramic sherd (Figure 5.6). The non-charred seed comes from Poaceae, *Panicum virgilatum* (Figure 5.7). I identified the two others as Cactaceae, *Opuntia* sp. (Figure 5.8).

Figure 5. 6: Ceramic sherd

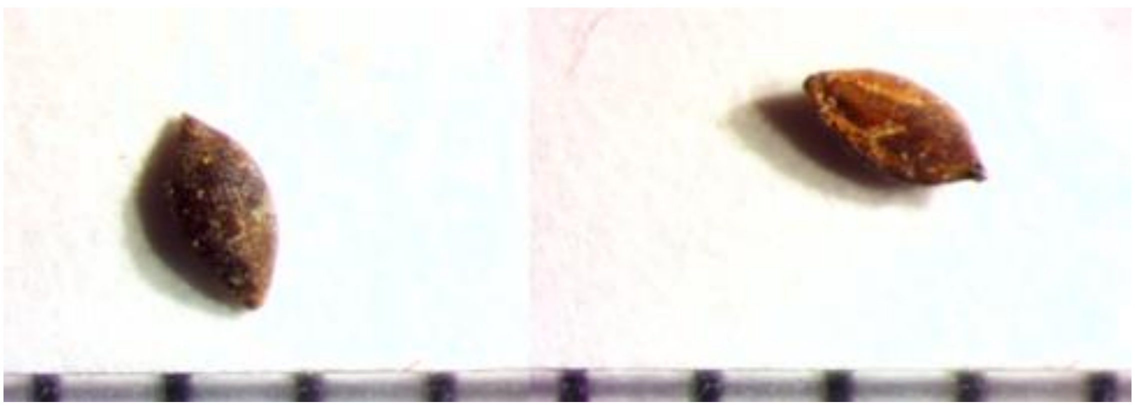


Figure 5. 7: Poaceae, *Panicum virgilatum*

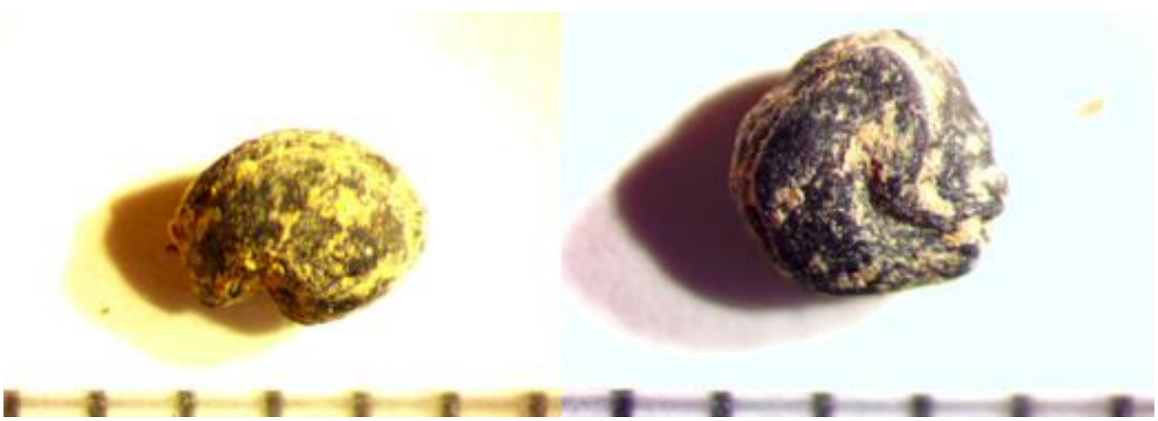


Figure 5. 8: Cactaceae, *Opuntia* sp.

FS 2893

This sample comes from the patio located near the large residential building (Structure 1). It dates as “Colonial or later” (Forde 2017b). I identified three seeds in this sample. There was a charred seed of Astereceae, *Madia sativa*, one seed tentatively identified as Poaceae (Cf.), and one of Polygonaceae, *Polygonum* sp. (Figure 5.9).

Figure 5. 9: Polygonaceae, *Polygonum* sp.

FS 1322

The last macrobotanical sample from Terrace 13 comes from the large residential building (Structure 1). As it is the case for all the other samples obtained from this terrace, it dates as “Colonial or later” (Forde 2017b). The dirt in this sample was stuck in big clumps, forcing me to meticulously destroy them in order to see if there was any botanical material inside. There were four charred seeds in this sample. One seed comes from Cf. Cactaceae, *Opuntia* sp., one likely from the Fabaceae family (Cf.), and one from Chenopodiaceae, *Chenopodium* sp. (Figure 5.10). The other seed is unknown (UNK 4). It is hard to identify, as it is missing half (Figure 5.11).

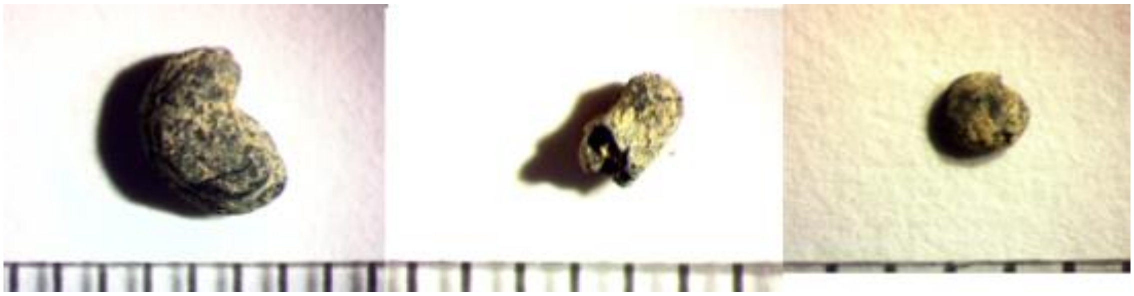


Figure 5. 10: Cf. Cactaceae, *Opuntia* sp.; Cf. Fabaceae; Chenopodiaceae, *Chenopodium* sp.

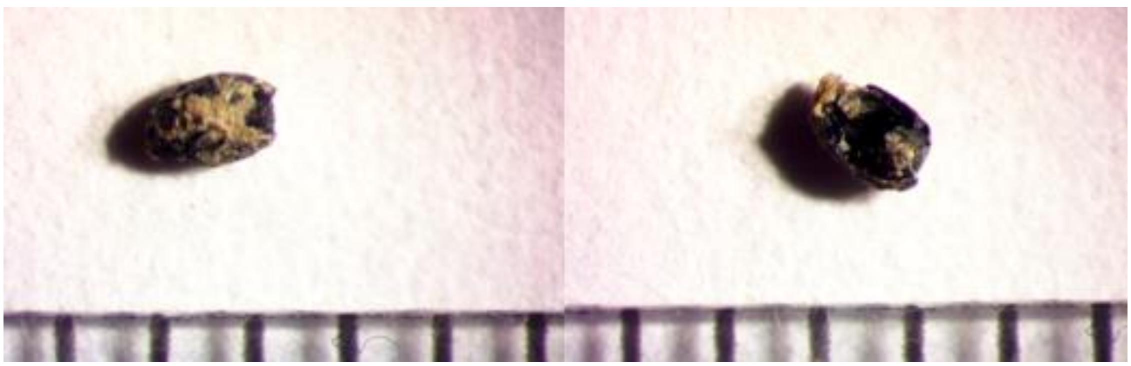


Figure 5. 11: UNK 4.

From the five samples coming from Terrace 13, I found 16 seeds coming from eleven different taxa, four of them still unknown. Table 5.2 presents all of the seeds identified at Terrace 13.

Table 5. 2: Macrobotanical results of Terrace 13

Taxon	LF count FS 2755	LF count FS 2759	LF count FS 1022	LF count FS 2893	LF count FS 1322	Total
Chenopodium sp.		1			1	2
cf. *Fabaceae* sp.					1	1
Madia sativa	1	1		1		3
Opuntia sp.			2			2
cf. *Opuntia* sp.					1	1
Panicum virgilatum			1			1
cf. *Poaceae* sp.				1		1
Polygonum sp.				1		1
UNK1	1					1
UNK2	1					1
UNK3		1				1
UNK4					1	1

Note: LF = Light fraction botanical remains, UNK = Unknown

Terrace 10 North

I analyzed 18 macrobotanical samples from Terrace 10 North. Table 5.3 presents the provenience of the samples, their weight, the number of large charcoal fragments found in each of them, and the presence or absence of shells and artifacts. I did not count charcoal fragments larger than 2 mm once I passed the 1000 mark. I separate the results using the four archaeological time periods identified by Jamie Forde (2017b), starting with the Postclassic Period, followed by the Postcolonial/Colonial Period, the Colonial Period, and finishing with the Colonial or later Period.

Table 5. 3: Provenience and information about Terrace 10 North

Archaeological context	FS Number	Weight (g)	Charcoal > 2 mm	Shells (0–3)	Artefacts*
N T10 UUVV 8–9 Lot 1	3178	56,6905	1000	1	c, l
N T10 UUVV 8–9 Lot 3	3154	194,3682	1000	1	z
N T10 UUVV 8–9 Lot 3	3176.1	148,1736	315	2	z, l
N T10 UUVV 8–9 Lot 2	3176.2	202,65	1000	1	
N T10 I60 Lot 5	3106	94,4434	1000	2	
N T10 16M L5	1060	10,0834	49	1	
N T10 F4 L14	2001	218,0735	452	1	z, z, c
N T10 F4 L2	1829	14,0232	235	1	
N T10 8Y L8	779	UNK	982	3	l, z
N T10 8Y L7	776	27,2698	289	2	
N T10 11X L10	243	26,8303	488	2	
N T10 11X L5	192	45,1245	25	2	
N T10 8Y L9	789	24,3077	737	3	
N T10 F3 L13	2074	14,6697	70	1	
N T10 F2 L16	2067	6,2807	18		
N T10 F6(S) L1	2952	65,6615	89	1	
N T10 F8 L3	1963	46,1301	1000	3	
N T10 8Y L6	772	11,868	93		

*c= ceramic sherds, l = lithic debitage, z = zooarchaeological remains

FS 3178

This sample is one of the four that probably date from the Postclassic Period (Forde 2017b), with FS 3154, and two samples sharing the same FS (3176), that I renamed 3176.1 and 3176.2 to clarify the presentation of the results, as explained later. They all come from the same midden. A biologist, Silvia Pérez Hernández, identified bones of turkey, white-tailed deer, dog, rabbit, and birds in the midden deposit. I found two artifacts while analyzing this light fraction. The first is a fragmented lithic tool (Figure 5.12), and the second a ceramic sherd (Figure 5.13). There was a vast quantity of small animal dung in this sample. I found ten charred seeds and one charred fruit (samara) in the light fraction. Seven seeds probably come from the Cactaceae family (cf.) (Figure 5.14). I was able to identify one of them as Cactaceae, *Opuntia* sp. (Figure 5.15). I was not able to identify the other cf. Cactaceae seeds to a genus. One seed has been identified as Chenopodiaceae, *Chenopodium* sp., and another as Cyperaceae, *Scirpus* sp.. I was not able to identify the other seed (UNK5). UNK5 is highly fragmented, rendering any identification very hard (Figure 5.16). The samara has not been identified to the tree that produced it and was named UNK6 (Figure 5.17).

Figure 5. 12: Lithic artifact

Figure 5. 13: Ceramic sherd

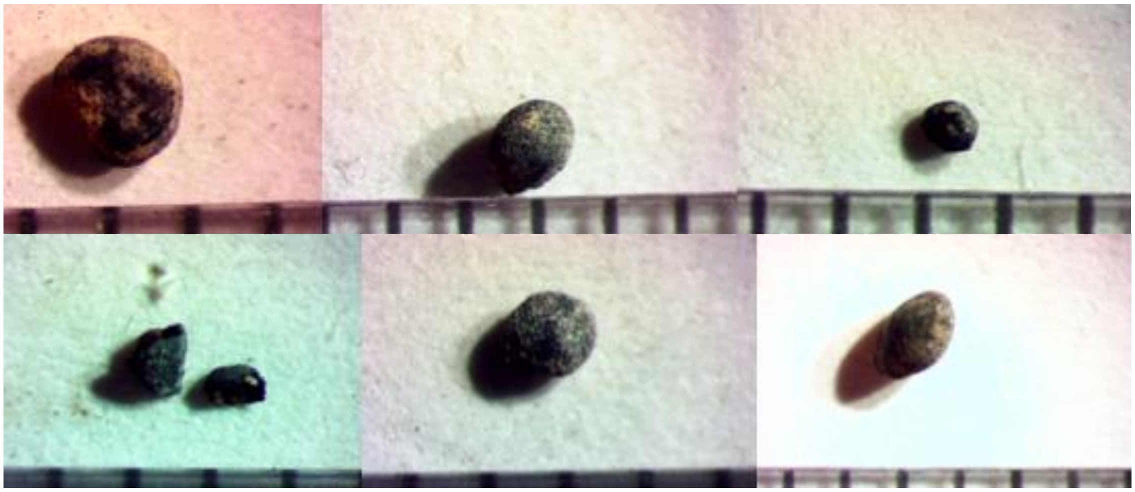


Figure 5. 14: Six seeds of cf. Cactaceae

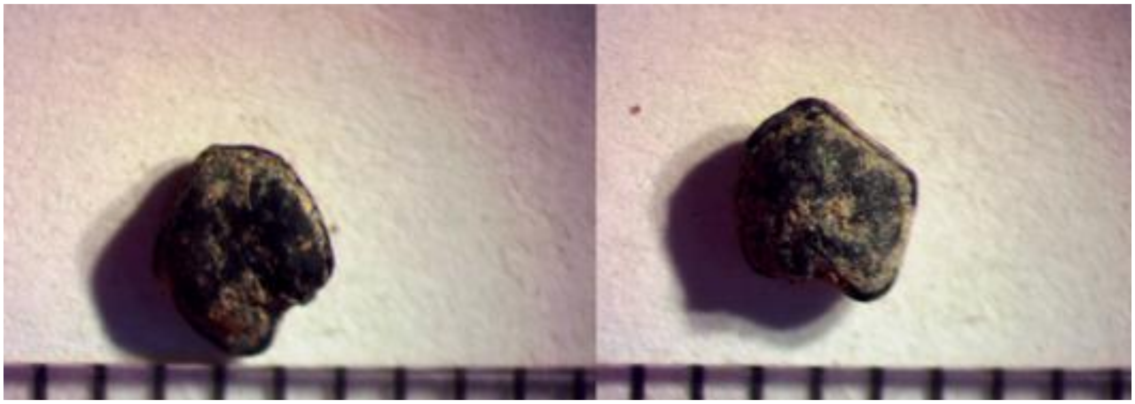


Figure 5. 15: Cactaceae, *Opuntia* sp.

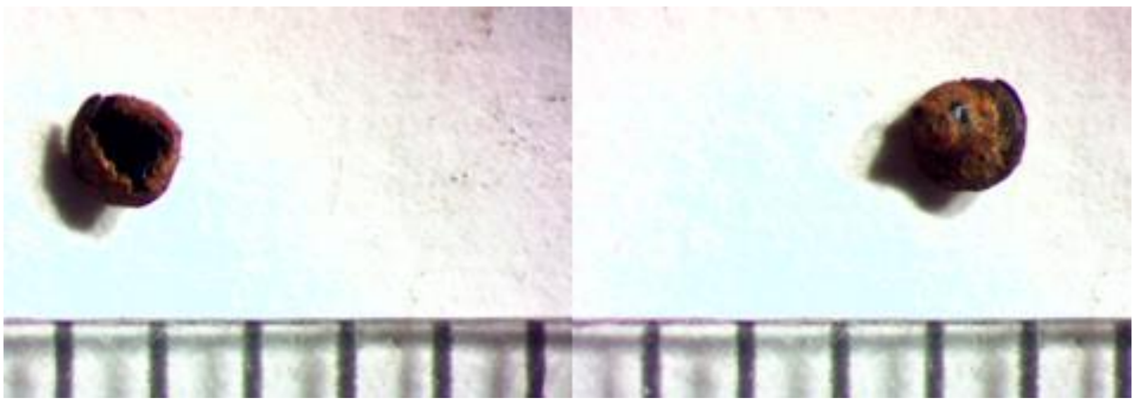


Figure 5. 16: UNK 5

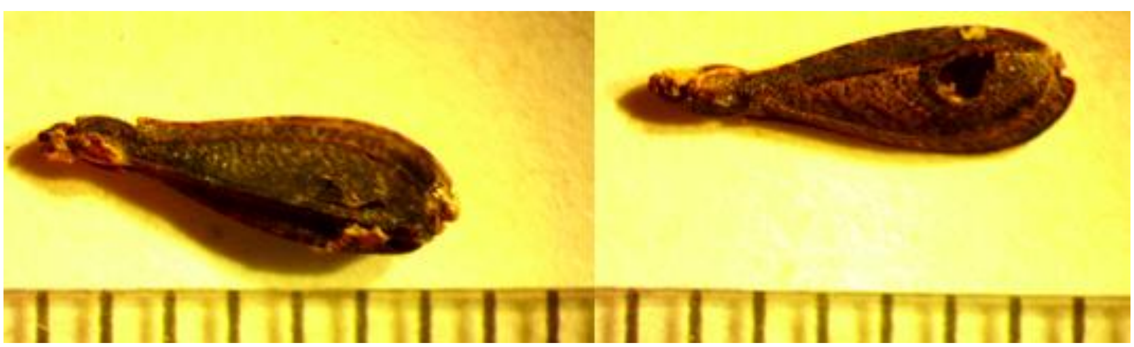


Figure 5. 17: Samara. UNK 6

FS 3154

In this sample, there were eight charred seeds and one small fragment of bone. I reached the 1000 charcoal count before I finished the >4.75 mm size, demonstrating the great quantity of charcoal present in FS 3154. There was also a great amount of dung produced by small animals, and recent insect eggs in the light fraction. Seven of the seeds come from either Chenopodiaceae, *Chenopodium* sp. or Amaranthaceae, *Amaranthus* sp. (Cheno/Am). The two plants produce very similar seeds, and it is sometimes difficult to definitely identify them. The other seed is unknown (UNK7) (Figure 5.18). Its surface is very similar to the seeds found in the Malvaceae family, but I was not able to find any seed sharing the same structure.

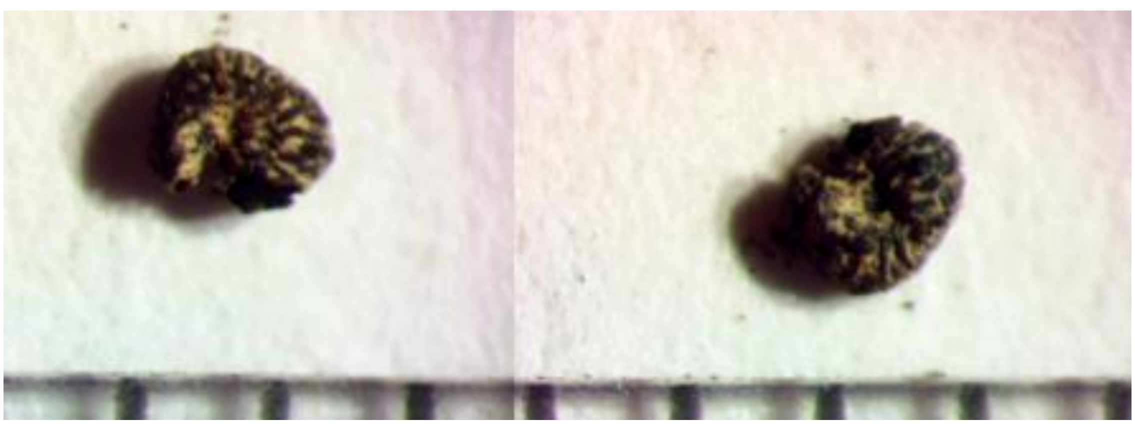


Figure 5. 18 : UNK 7

FS 3176.1

I received two samples with the same FS number (3176). They were retrieved from the same archaeological context, but come from different lots. I renamed them in order to avoid any confusion. The first one I analyzed was renamed 3176.1, and the second 3176.2. In the first sample, I uncovered two artifacts: a bone fragment, and a lithic artifact (Figure 5.19). I was also able to identify four charred seeds of *Cheno/Am* sp. (Figure 5.20).

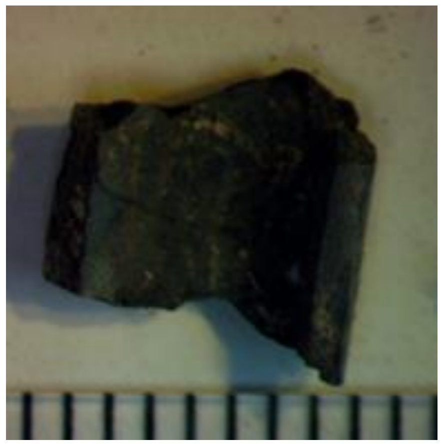


Figure 5. 19: Lithic artifact

Figure 5. 20: *Cheno/Am* sp. seeds

FS 3176.2

The last sample probably dating from the Postclassic period comes from FS 3176.2. This sample is the only macrobotanical one where I found the presence of maize (*Zea mays)*. There were five fragments of cobs and one kernel (Figure 5.21).

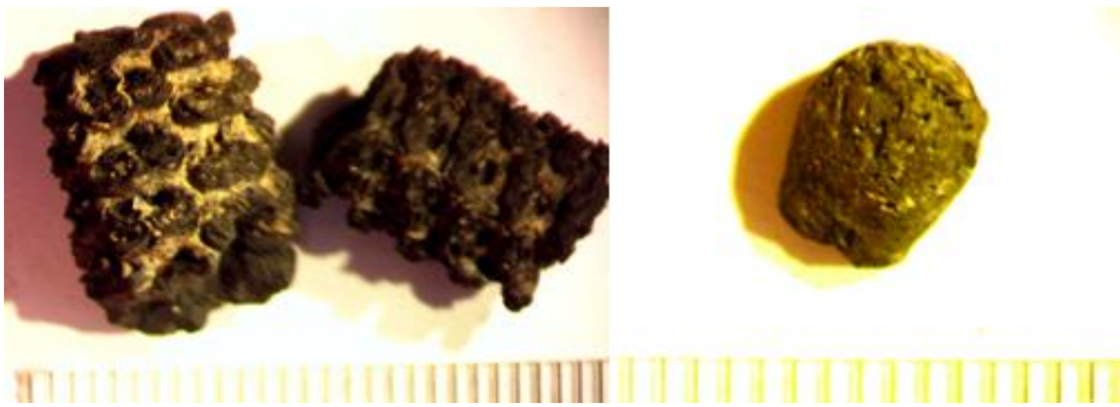


Figure 5. 21**: Maize (*Zea mays*) cob fragments and kernel**

In this section, I analyzed the four samples from Terrace 10 likely dating from the Postclassic Period. I found 29 seeds coming from ten different taxa, three of them still unknown. Table 5.4 presents all of the seeds identified at Terrace 13.

Table 5. 4: Macrobotanical results of the Postclassic midden of Terrace 10

Taxon	LF count FS 3178	LF count FS 3154	LF count FS 3176.1	LF count FS 3176.2	Total
Cf. *Cactaceae* sp.	6				6
Cheno/Am sp.		7	4		11
Chenopodium sp.	1				1
Opuntia sp.	1				1
Scirpus sp.	1				1
Zea mays cobs				5	5
Zea mays kernels				1	1
UNK5	1				1
UNK6	1				1
UNK7		1			1

Note: LF = Light fraction botanical remains, UNK = Unknow

FS 3106

Four samples from Terrace 10 probably date from the Postclassic/Colonial Period. FS 3106 is one of the two (with FS 1060) to come from the sub-floor of the South structure (Forde 2017b). In this archaeological unit, archaeologists found two earlier construction phases (Forde 2015:207). Archaeologists also found a large fragment of a Postclassic ceramic brazier under a stone alignment and other fragments of the same brazier in the filling below. It is possible the brazier was deposited as an offering by the occupants of the later phase of construction, although this theory cannot be confirmed with the data gathered on-site (Forde 2015:208).

In this sample, I found three charred seeds and one unidentified dried fruit. One seed was from Chenopodiaceae, *Chenopodium* sp., and another from Asterečeae, *Madia sativa*. The surface of the last seed is very similar with the ones found in the Solanaceae family, which enable me to tentatively identify it to it (cf.) (Figure 5.22).

Figure 5. 22: cf. *Solanaceae* sp.

FS 1060

In this sample, I found two unidentified dried fruits, two fragmented pits, and one dried stalk, which I was not able to identify. There were nine charred seeds in this sample. I have tentatively identified three of them as cf. Poaceae. One Poaceae seed was identified to the genus *Panicum* sp., and the five other seeds all come from Clusiaceae, *Vismia* sp. (Figure 5.23).

Figure 5. 23: Clusiaceae, *Vismia sp.*

FS 2001

The last two samples probably dating from the Postclassic/Colonial Period all come from Feature 44, the ring of stone found in the central patio of the residential building.

In this sample, I found 64 seeds, one unidentified dried fruit, and three artifacts (one small ceramic sherd and two small bones). 31 seeds come from *Cheno/Am* sp., 29 from UNK1, two from Cyperaceae, *Scirpus* sp., and one from Brassicaceae, *Lepidium* sp. Finally, one grain was found, but I was not able to identify it (UNK9) (Figure 5.24).

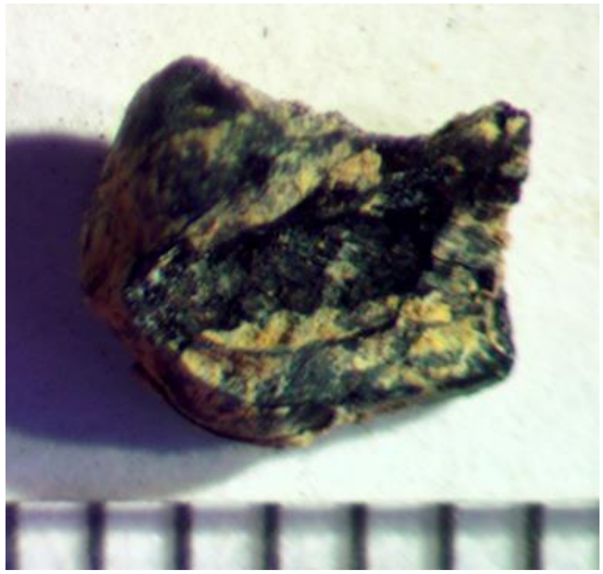


Figure 5. 24: UNK 9

FS 1892

This sample was composed of many charred seeds. There were 33 UNK1 seeds, 15 *Cheno/Am* sp. seeds, and 4 Cyperaceae, *Scirpus* sp. seeds. There were also three unidentified dried fruits and one dried fruit pit, too fragmented to be identified.

In this section, I analyzed the four samples from Terrace 10 likely dating from the Postclassic/Colonial Period. I found 139 macrobotanical remains coming from 14 different taxa, five of them still unknown. Table 5.5 compiles altogether the macrobotanical remains identified for this time frame.

Table 5. 5: Macrobotanical results of the Postclassic/Colonial Period of Terrace 10

Taxon	LF count FS 3106	LF count FS 1060	LF count FS 2001	LF count FS 1892	Total
Cheno/Am sp.			31	15	46
Chenopodium sp.	1				1
Lepidium sp.			1		1
Madia sativa	1				1
Panicum sp.		1			1
cf. *Poaceae* sp.		3			3
Scirpus sp.			2	4	6
cf. *Solanaceae* sp.	1				1
Vismia sp.		5			5
UNK dried fruits	1	2	1	3	7
UNK dried stalks		1			1
UNK fragmented pits		2		1	3
UNK1			29	33	62
UNK9			1		1

Note: LF = Light fraction botanical remains, UNK = Unknown

FS 779

There are seven samples from Terrace 10 probably dating from the Colonial Period. FS 779 is one of the five samples coming from the Colonial midden, along with FS 776, 243, 192, and 789. As mentioned earlier, Silva Pérez Hernández identified bones from four species coming from this midden: turkey, white-tailed deer, rabbit, and two bones coming from a cow. There were two artifacts in the light fraction: a white feather and a stone flake.

There were 10 unidentified dried fruits in this sample and 11 seeds. One was tentatively identified as cf. Astereceae sp., and another as cf. Cactaceae sp. I have identified one seed *Cheno/Am* sp. The other identified seeds were as follows: one seed of Chenopodiaceae, *Chenopodium* sp., one of Clusiaceae, *Vismia* sp., one of cf. Poaceae, *Eragrostis* sp., one non-charred seed of Poaceae, *Melinis repens*, one of Cf. Poaceae, and one of Polygonaceae *Polygonum* sp. There were two unknown seeds: UNK10 (Figure 5.25), and a grain named UNK11 (Figure 5.26).

At first, UNK10 looked to me as if it was a chickpea (Fabaceae, *Cicer arietinum*). I decided to burn dried chickpeas and compare the results obtained. The chickpeas were unfortunately way too big compared to UNK10 and the general shape was not exactly the same, ruling out this hypothesis.

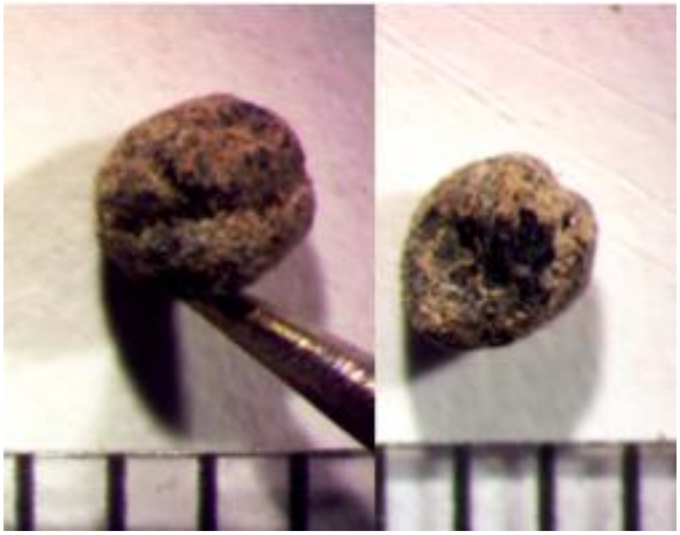


Figure 5. 25: UNK 10

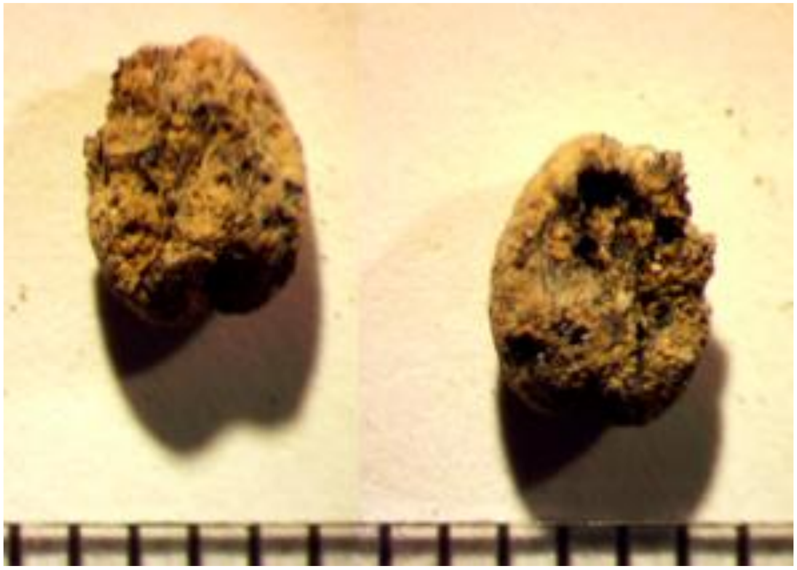


Figure 5. 26: UNK 11

FS 776

There were 14 unidentified fragmented dried fruits in this sample, but there were no seeds at all.

FS 243

In this sample, I was able to identify many seeds, in addition to the nine unidentified dried fruits recovered. There was one seed of UNK1, and one of UNK3. One seed came from Astereceae, *Madia sativa*, one from Chenopodiaceae, *Chenopodium* sp., one from cf. Fabaceae sp. I also found one charred seed of *Melinis repens*, and three non-charred seeds of the same species.

FS 192

In this sample, there were no charcoal fragments of more than 4.75 mm. There were four seeds and six unidentified dried fruits. One of the seed was of UNK4, one of UNK2, one charred seed of Poaceae, *Melinis repens* and one seed of Cf. Poaceae sp.

FS 789

In the last sample coming from the Colonial midden, I found two unidentified dried fruits and one seed of *Cheno/Am* sp.

FS 2074

This sample comes from a storage compartment located in the South Structure (Feature 23) (Forde 2017b). Archaeologists uncovered a carved stone decorated with flower motifs (Forde 2015:207). In this sample, I did not find any seeds. There were three unidentified dried fruits.

FS 2067

This is the last sample probably dating from the Colonial Period. It comes from Feature 24, a hearth found in the South Structure, where archaeologists found “high quantities of ash and fire cracked rock, but no other artifacts” (Forde 2015:206).

Surprisingly, the light fraction analyzed did not contain many charcoal fragments, and none of them were bigger than 4.75 mm. There were a lot of roots, but no other botanical remains were found in this sample.

I analyzed seven samples from Terrace 10 likely dating from the Colonial Period. I found 69 macrobotanical remains coming from 18 different taxa, seven of them still unknown. Table 5.6 presents the six samples that contained macrobotanical remains.

Table 5. 6: Macrobotanical results of the Colonial Period of Terrace 10

Taxon	LF count FS 779	LF count FS 776	LF count FS 243	LF count FS 192	LF count FS 789	LF count FS 2074	Total
cf. *Asteraceae* sp.	1						1
cf. *Cactaceae* sp.	1						1
Cheno/Am sp.	1				1		2
Chenopodium sp.	1		1				2
cf. *Eragrostis* sp.	1						1
cf. *Fabaceae* sp.			1				1
Madia sativa			1				1
Melinis repens	1		4	1			6
cf. *Poaceae* sp.	1			1			2
Polygonum sp.	1						1
Vismia sp.	1						1
UNK dried fruits	10	14	9	6	2	3	44
UNK1			1				1
UNK2				1			1
UNK3			1				1
UNK4				1			1
UNK10	1						1
UNK11	1						1

Note: LF = Light fraction botanical remains, UNK = Unknown

FS 2952

The last three samples that come from Terrace 10 probably date from the Colonial Period or later (Forde 2017b). The first one comes from Feature 42, a fire pit located in the West building (Forde 2015:194). The charcoal fragments located in the light fraction were very large compared to the other samples analyzed. I was only able to find one dried fruit in this sample.

FS 1963

The last two samples come from F45, a fire pit located in the East portion of the terrace. Archaeologists uncovered there a “large amorphous lead artifact” (Forde 2015:194, 221). This light fraction was heavily carbonized. I was only able to find one dried fruit and a large quantity of shells.

FS 772

There were nine dried fruits, two seeds of UNK4, and one of UNK11 in this sample. There was also a dried stalk. Unfortunately, I was not able to identify any of these to a genus.

I analyzed three samples from Terrace 10 likely dating from the Colonial Period or later. I found six macrobotanical remains coming from four unknown taxa. Table 5.7 presents the distribution of the plant remains

Table 5. 7: Macrobotanical results of the Colonial Period or later of Terrace 10

Taxon	LF count FS 2952	LF count FS 1963	LF count FS 772	Total
UNK4			2	2
UNK11			1	1
UNK dried fruits	1	1	9	2
UNK dried stalks			1	1

Note: LF = Light fraction botanical remains, UNK = Unknown

I analyzed 18 samples coming from Terrace 10 and ranging from the Postclassic to the Colonial Period and later. I total, there were 243 macroremains, coming from 31 taxa, 13 of them unknown. Table 5.8 separates the macroremains identified in those 18 samples, divided by their time period.

Table 5. 8: Macrobotanical results from Terrace 10

Taxon	LF count Postclassic	LF count Postclassic/Colonial	LF count Colonial	LF count Colonial or later	Total
cf. *Asteraceae* sp.			1		1
Cf. *Cactaceae* sp.	6		1		7
Cheno/Am sp.	11	46	2		59
Chenopodium sp.	1	1	2		4
cf. *Eragrostis* sp.			1		1
cf. *Fabaceae* sp.			1		1
Lepidium sp.		1			1
Madia sativa		1	1		2
Melinis repens			6		6
Opuntia sp.	1				1
Panicum sp.		1			1
cf. *Poaceae* sp.		3	2		5
Polygonum sp.			1		1
cf. *Solanaceae* sp.		1			1
Scirpus sp.	1	6			7
Vismia sp.		5	1		6
Zea mays cobs	5				5
Zea mays kernels	1				1
UNK dried fruits		7	44	2	53
UNK dried stalks		1		1	2
UNK fragmented pits		3			3
UNK1		62	1		63
UNK11			1	1	2
UNK2			1		1
UNK3			1		1

Table 5. 8 continued: Macrobotanical results from Terrace 10

Taxon	LF count Postclassic	LF count Postclassic/Colonial	LF count Colonial	LF count Colonial or later	Total
UNK4			1	2	3
UNK5	1				1
UNK6	1				1
UNK7	1				1
UNK9		1			1
UNK10			1		1

Note: LF = Light fraction botanical remains, UNK = Unknown

FS 2713

To conclude this section on the macrobotanical results, I will include the analysis of one macrobotanical sample coming from Terrace 1 that I will use in the next chapter. This terrace was probably occupied during the Terminal Formative Ramos Phase and then centuries later in the Postclassic Period (Forde 2015:152–153). The archaeological excavation was stopped, as the occupation was not linked with the Colonial Period. Only one macrobotanical sample from this terrace was sent to the MPERF. In the light fraction, there were a lot of roots and nearly no organic material. There was a very high quantity of ants. I found only one dried pit and one seed of Clusiaceae, *Vismia* sp.

I analyzed a total of 22 light fractions obtained from soil samples recovered in Achiutla in order to identify their macrobotanical remains. They came mostly from two terraces, 10 and 13, while one sample came from Terrace 1. Combined altogether, there were 261 macrobotanical remains, from 33 taxa, 13 of them unknown. Combined with the microbotanical results, these plants provide an interesting representation of the plants present at Achiutla during the Postclassic and Early Colonial Periods.

Microbotanical Analysis

For the microbotanical analysis, I selected five artifacts from the ones I received from Dr. Forde. I washed, sampled, and analyzed the residues from two *piedras de moler*, or grinding stones (FS 3184 and 55), two obsidian blades (FS 124 and 3171.1), and one sherd of *majolica* ceramic (FS 1584). The four lithic artifacts come from Terrace 10, and the ceramic sherd comes from Terrace 13. The first grindstone (FS 3184) analyzed from

Terrace 10 comes from a slopewash in the first stratum of Terrace 10. Its date is still unclear. The first obsidian blade (FS 3171.1) recovered comes from the Postclassic midden, while the second obsidian blade (FS 124) and the second *piedra de moler* (FS 55) both come from the Colonial midden. Finally, the *majolica* fragment (FS 1584) comes from the ash pit of Terrace 13 mentioned earlier and probably dates from the Colonial Period. The microbotanical results obtained from those five samples are minimal. There were only a few diagnostic phytoliths and starch grains.

Terrace 10

The large grindstone (FS 3184) yielded only general, nondiagnostic siliceous tissues (Figure 5.27). I did not found any identifiable phytolith, nor any starch grains on the six slides I examined.

Figure 5. 27**: General, nondiagnostic siliceous tissue (Sonicated wash, 2nd slide)**

The largest obsidian blade analyzed (FS 3171.1) gave the most interesting results of the five artifacts analyzed. There were diagnostic starch grains coming from the dry and the wet washes, but none from the sonicated one. On the first slide of the dry wash, there were two identical starch grains. One has cavity-like damage (Torrence and Barton 2006; Figure 4.16), and the other is in good condition. I named them Unknown starch 1 (UNKS1) (Figure 5.29). I also found another unknown starch, which I named UNKS2 (Figure 5.30). Finally, I identified one round maize starch (Poaceae, *Zea mays*) (Figure 5.31).

Figure 5. 28: Nondiagnostic siliceous tissue (Dry wash, 1st slide)

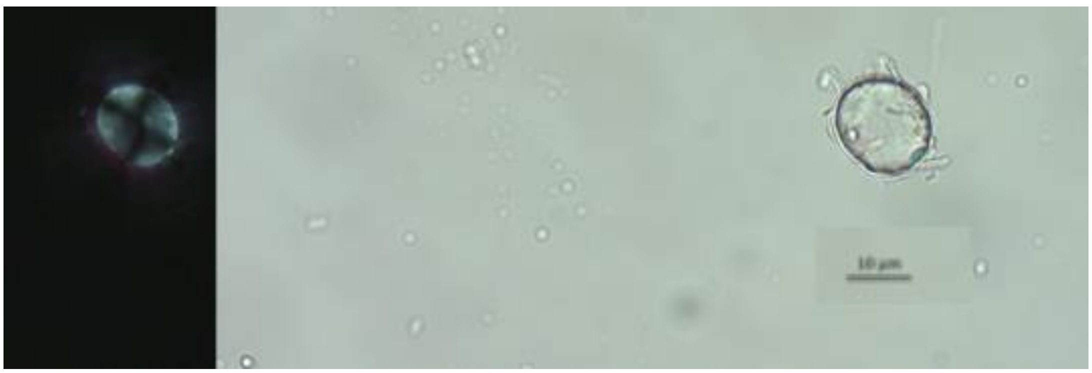


Figure 5. 29: UNKS 1 (Dry wash, 1st slide)

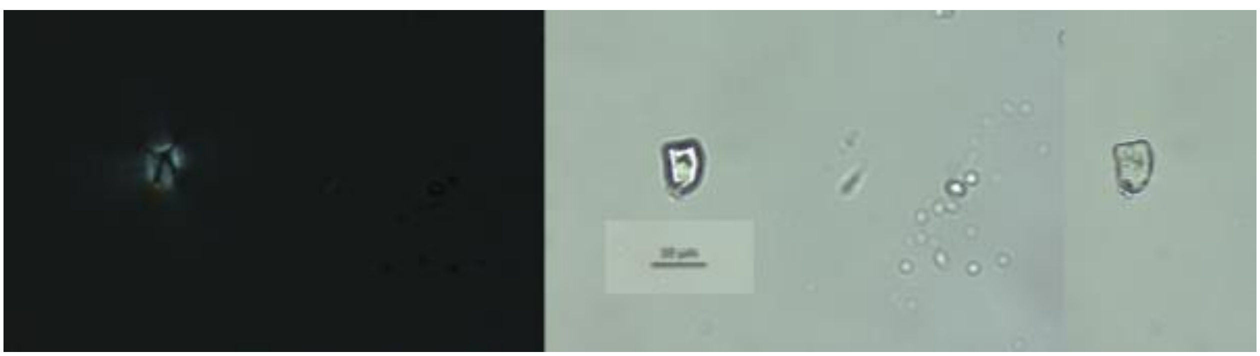


Figure 5. 30: UNKS 2 (Dry wash, 1st slide)

Figure 5. 31: Maize (*Zea mays*) starch (Dry wash, 1st slide)

On the second slide of the dry wash, I found one round starch coming from maize. Finally, on the second slide of the dry wash, I found one starch grain of UNKS1.

The second obsidian blade analyzed (FS 124) yielded only one starch of UNKS1. It came from the first slide of the sonicated wash, while the second grindstone analyzed had only nondiagnostic siliceous tissues.

<u>Terrace 13</u>

The only two starch grains found in this sample come from the second slide of the wet wash. The first one had extinction cross damage (UNKS3) (Figure 5.32), while the other was fractured (UNKS4) (Figure 5.33).

Figure 5. 32: UNKS3. Extinction cross damage

Figure 5. 33: UNKS4. Fractured starch

Unfortunately, the microbotanical results are very limited (Table 5.9). From the five artifacts analyzed, I was not able to find one identifiable phytolith. I did find nine starch grains, 7 of them being unknown. Even if these results are not overwhelming, the presence of maize on one artifact is very interesting, as it supports the macrobotanical results obtained during the same time period (Postclassic).

Table 5. 9: Microbotanical results

Taxon	SG count FS 3184	SG count FS 55	SG count FS 3171.1	SG count FS 124	SG count FS 1584	Total
Zea mays			2			2
UNKS1			3	1		4
UNKS2			1			1
UNKS3					1	1
UNKS4					1	1

Note: SG = Starch grains, UNKS = Unknown starch

Preservation Issues

Most of the macrobotanical samples come from contexts not directly linked to foodways. Apart from the two middens where archaeologists found zooarchaeological remains linked with Mixtec diet, the samples come from different archaeological features including a sub-floor and a storage. As the archaeological fieldwork was aimed towards other everyday life activities and craft production (obsidian and lead) to answer the research questions, it is normal that the samples taken did not produce an overabundance of evidence related to foodways. Unfortunately, this limits the possibility to obtain direct knowledge of foodways during the Postclassic to Colonial transition. Maize is only present during the Postclassic Period, and beans and squash are absent from the paleoethnobotanical record entirely. However our knowledge of Mixtec lifeways and foodways based on historical documents and other archaeological research suggests these plants were likely at the core of the Mixtec diet at Achiutla before and after the Spanish Conquest.

Preservation factors can also be impacted by the selection of samples. Archaeologically, seeds usually preserve only when charred, waterlogged, or desiccated, due to various decomposition factors. This means that when the remains of a fire pit are analyzed, the chances of recovering charred seeds that people dropped by accident while cooking are higher than finding carbonized seeds in other contexts without the possibility of charring, such as under a floor. The macrobotanical samples, coming as they are from different architectural features, middens, and a few fire pits, revealed only a limited number of seeds. This limited number helps to explain the absence of plants that played a key role, not only in the Mixtec diet, but also in other aspects of Mixtec culture.

In her Master's thesis, Margaret Houston highlighted certain conditions that can limit the preservation of many plants (1983:55–59). According to Houston, squash seeds do not preserve well because of the "dryness of the outer part of the seed" (1983:55). Beans can also be found less easily, in great part because of the location of diagnostic features on the seed. The hilum and raphe are located on the testa (seed coat) of the bean, which is more fragile and thus less likely to preserve. Other seeds have high content of sugar, starch or oil, products that make the seed highly flammable in contexts where they might be charred. According to Hard et al. (1996:273), the seeds with a hard testa (the exterior) have better chances of being find archaeologically, as they can survive digestion. Because of these "differential preservation [issues] between different taxa and plant parts" (Lennstrom and Hastorf 1992:220; Dussol et al. 2016:8), certain plants might not be present archaeologically, even if they were consumed at the site.

In other cases, modes of food preparation challenge our ability to identify the plant remains (1983:56), such as grinding, where the seeds are destructed. The plants eaten raw also tend to preserve less, as there is less chance for them to fall accidentally in a fire and get charred (Hars et al. 1996:270). Also, if the plant remains were exposed to low temperatures, instead of charring, they will become more fragile, which will affect their archaeological preservation (Boardman and Jones 1990). Finally, the use of braziers to cook plants in Oaxaca can be problematic for archaeologists, as the cooked seeds reach a higher level of charring than in normal fire pits, and because the remains can easily be discarded anywhere, possibly away from domestic space (Houston 1983:57). Finally, certain plant remains were used as fuel and burnt completely, leaving nearly no archaeological traces (Houston 1983:59). Other archaeological factors can also impact the preservation of plant remains. Animals or insects can dig in the soil and consume macrobotanical remains, while roots can displace or damage the archaeological plant remains (Hart et al. 1996:271). Finally, soil movements or a succession of dry and wet periods can damage and destroy the macrobotanical remains, impacting our ability to identify them (Hart et al. 1996:271).

The microbotanical results were also very limited. I found damaged starch grains on the *majolica* ceramic sherd, which makes me believe it was used to contain cooked foods such as stews, soups, or porridges. As mentioned earlier, starch grains do not survive high temperatures (Henry et al. 2009) and the fact that the only two recovered were damaged indicates the use of the majolica vessel more for cooked foods than for storage or preparation of raw foods. The microbotanical remains identified from the analysis of the two obsidian blades were also very minimal. The results obtained from this type of artifact can be very interesting (Morell-Hart et al. 2014), but I was only able to identify two maize starch grains on one of the blades, from the dry wash. Finally, the two *piedras de moler* did not yield significant results. The limited number of artefacts examined to obtain microbotanical results might explain the few results obtained. By examining more artefacts, I believe that I would have been able to obtain a more precise understanding of the foodways of the occupants of Terraces 10 and 13.

Summary of Results

In this research, I identified 270 paleoethnobotanical remains, and 36 taxa (Table 5.10). As I will demonstrate in the next chapter, combined with the macrobotanical results, the microbotanical results still aid in providing a better understanding of Mixtec foodways and plant management.

Table 5. 10: Combined paleoethnobotanical results

Taxon	LF Terrace 10	LF Terrace 13	LF Terrace 1	SG Terrace 10	SG Terrace 13	Total
cf. *Asteraceae* sp.	1					1
Cf. *Cactaceae* sp.	7					7
Cheno/Am sp.	59					59
Chenopodium sp.	4	2				6
cf. *Eragrostis* sp.	1					1
cf. *Fabaceae* sp.	1	1				2
Lepidium sp.	1					1
Madia sativa	2	3				5
Melinis repens	6					6
Opuntia sp.	1	2				3
cf. *Opuntia* sp.		1				1
Panicum sp.	1					1
Panicum virgilatum		1				1
cf. *Poaceae* sp.	5	1				6
Polygonum sp.	1	1				2
cf. *Solanaceae* sp.	1					1
Scirpus sp.	7					7
Vismia sp.	6		1			7
Zea mays	6			2		8
UNK dried fruits	53					53
UNK dried stalks	2					2
UNK fragmented pits	3		1			4
UNK1	63	1				64
UNK2	1	1				2
UNK3	1	1				2

Table 5.10 continued. Combined paleoethnobotanical results

Taxon	LF Terrace 10	LF Terrace 13	LF Terrace 1	SG Terrace 10	SG Terrace 13	Total
UNK4	3	1				4
UNK5	1					1
UNK6	1					1
UNK7	1					1
UNK9	1					1
UNK10	1					1
UNK11	2					2
UNKS1				4		4
UNKS2				1		1
UNKS3					1	1
UNKS4					1	1

Note: LF = Light fraction botanical remains, SG = Starch grains, UNK = Unknown, UNKS = Unknown starch

Chapter 6: Identified Plants Uses

In order to determine of the Mixtecs of Achiutla negotiated the arrival of new foods items at Achiutla, it is crucial to build an understanding of the uses of the plants identified in this research. This is even more important, as this is the first exhaustive Colonial paleoethnobotanical study made in the *Mixteca* region. Macrobotanical and microbotanical analysis revealed 36 taxa from 11 identified families. In this chapter, I interpret the combined results of the macrobotanical and microbotanical analyses. I explore possible uses associated with the identified plants in order to provide additional data to complement the already established archaeological and historical knowledge of the site. I combine samples coming from a single archaeological context (feature or structure) in order to compare the paleoethnobotanical evidences with the interpretations already made about the function of each location. I start by focusing on Terrace 13, comprised entirely of Colonial deposits. I follow these interpretations with those of Terrace 10, where I separate results based on time period: Late Postclassic, Postclassic/Colonial, Colonial, and Colonial or later. Finally, I address botanical preservation issues that might have impacted my results, conclude this chapter with an overview of all the botanical elements, including the results of both terraces.

Terrace 13: Colonial Period

Five macrobotanical samples and one microbotanical sample came from Terrace 13. Three of the light fractions and a *majolica* ceramic fragment came from the ash pit (Feature 21). One other macrobotanical sample came from the patio near the large residential building, and the last one came from the building itself (Structure 1) (see Figures 6.1 and 6.2). All of these samples probably date from the Colonial Period or later.

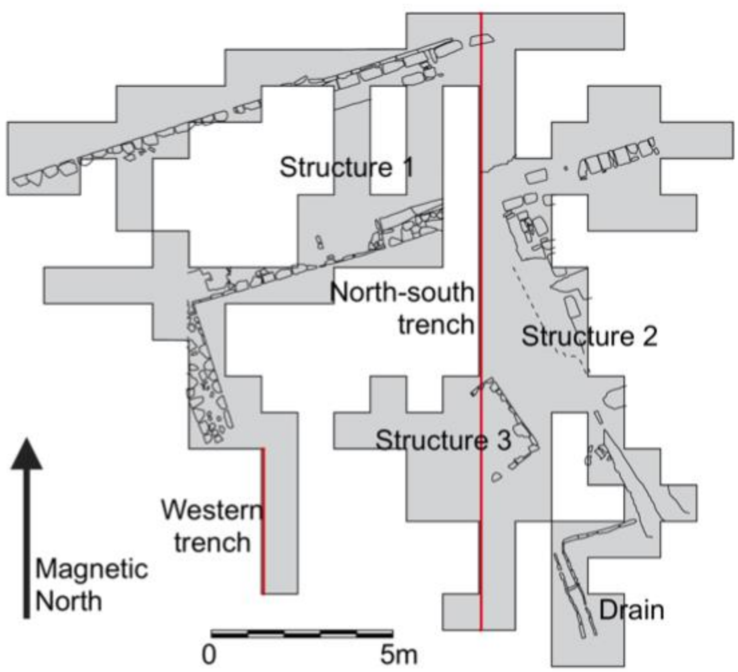


Figure 6. 1: Schematic of excavation units at Terrace 13 North (Forde 2015:164)

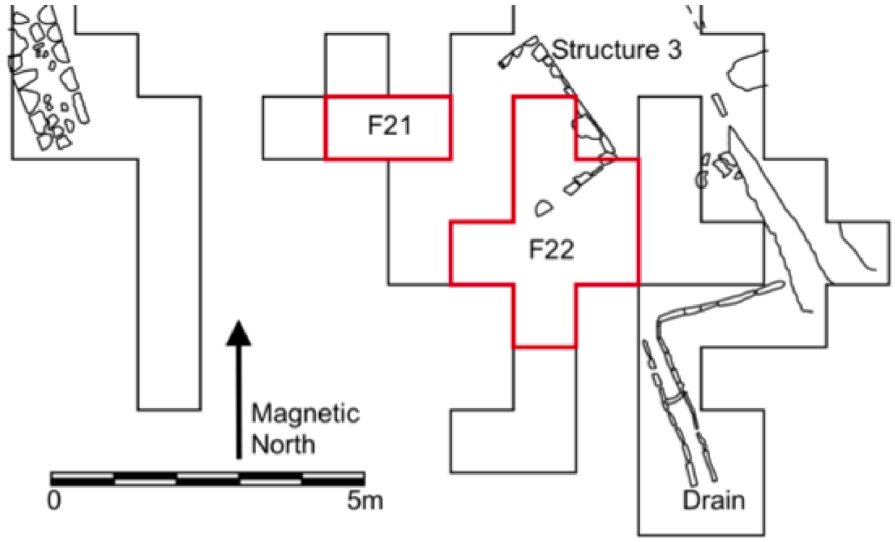


Figure 6. 2: **Location of the ash pit (F21). (Forde 2015:177)**

The Ash Pit (Feature 21), Terrace 13 North

As mentioned previously, the ash pit seems to have been excavated during the Colonial Period and filled with ash. Jamie Forde believes it not to be a midden, but rather the remaining traces of an activity associated with the creation of a great quantity of ash (Forde 2015:176–179). The presence of lead concentrations at the terrace demonstrates that lead was processed on site, and the ash pit could have played a role in this activity.

Table 6. 1: Ash pit (F21) of Terrace 13 paleoethnobotanical results

Number of seeds	Family	Taxon
2	Asteraceae	*Madia sativa*
1	Cactaceae	*Opuntia* sp.
1	Cf. Cactaceae	*Opuntia* sp.
1	Chenopodiaceae	*Chenopodium* sp.
1	Poaceae	*Panicum virgilatum*
1	UNK1	
1	UNK2	
1	UNK3	
1 starch grain	UNKS3	
1 starch grain	UNKS4	

A total of nine seeds were found in the three samples (FS 2755, 2759, and 1022) (Table 6.1). They were all charred, with the exception of the Poaceae, *Panicum virgilatum*. The microbotanical results obtained by the analysis of the *majolica* ceramic only led to the discovery of two unidentifiable damaged starch grains. Below, I link the identified plant remains to potential economic uses.

<u>Astereceae: *Madia sativa*</u>

The *Madia sativa* species (tarweed, Chili tarweed) were important during pre-Columbian times in the Pacific areas of North and South America (Zardini 1992:39–40). In South America, it was grown in fields, while the plant remained wild in North America. The seeds could be eaten raw, grounded into flour, or even transformed to obtain oil, the latter being commonly done in Chile (Zardini 1992:39–40; Schmeda-Hirschmann 1995:257). It grows easily in climates usually hard for plants, as it is resistant to frost, an issue occurring on occasions at Achiutla, and is able to survive in poor soils (Zardini 1992:40). This plant slowly disappeared from foodways and is now considered a weed in many parts of the Americas (Schmeda-Hirschmann 1995:257; Zardini 1992:39–40). In Peru, the introduced olive quickly took its place to produce oil, as the olive did not need to be sowed every year (Zardini 1992:40), saving commoners valuable time and effort. Later in time, *Madia sativa* has also been used in California to feed sheep in environments where the soil was too dry to cultivate other species (Marie-Victorin 2002:589). These uses, though drawn from examples elsewhere in the Americas, demonstrate the potential for tarweed to have been eaten raw or added to the flour necessary for the productions of tortillas in the Mixteca Alta.

<u>Cactaceae: *Opuntia* sp.</u>

Opuntia sp. (prickly pear, tuna, nopal) was an important genus of cacti in the pre-Columbian economy and foodways of Mesoamerica (Ebeling 1986; Casas and Barbera 2002; Lentz and Dickau 2005:174). When I visited San Miguel Achiutla, I noticed the presence of many modern *Opuntia* sp. growing at the archaeological site. The fruit (*tuna*) can be eaten raw or cooked, and it often accompanies sweetmeats (Ebeling 1986:696–701; Lentz and Dickau 2005:174). Its stems (pads) can be eaten and are often cooked as a vegetable (Ebeling 1986:696–701; Lentz and Dickau 2005:174). In Oaxaca today, it is easy to find cacti salads prepared with various varieties of the nopal cactus. The *Opuntia* sp. can also produce sugary syrup (*miel de tuna*), or even be fermented to produce *nochote/nochocle* (Ebeling 1986:696–701). This plant was very important for commoners, as it was "particularly abundant before the harvest season of maize", and was sometimes present even after the harvest season, providing a reliable source of food throughout the year (Casas and Barbera 2002:154–155).

Chenopodiaceae: *Chenopodium* sp.

Because of its high level of charring, I was not able to identify this seed to its species. Mixtec and other Indigenous groups of Mesoamerica often consume *Chenopodium* sp. seeds (*pazote, apazote*), and there is evidence that it was consumed in the past (Dressler 1953:128–129; Ebeling 1986:776; Lentz and Dickau 2005:66). Its leaves can be eaten as a green vegetable, and its seed can play the role of a cereal grain: it can be ground into flour, or toasted, which will make the grain pop (Dressler 1953:128–129; Ebeling 1986:776). *Chenopodium* sp. can also be used as a flavouring and this plant is very often combined with black beans (Lentz and Dickau 2005:66).

Poaceae: *Panicum virgilatum*

This plant is commonly found in Oaxaca and throughout North America. It is an herb that can grow up to 2 m and produces small grains (Cornejo and Janovec 2010:112). It is not consumed, but rather serves as grassland improvement in contemporary times (Valdés Reyna 2015:396–397).

Ash Pit in Terrace 13: Interpretation

As it is the case with the majority of the samples analyzed, the total number of seeds recovered from this context is fairly low. Of the nine seeds recovered, three are unfortunately unknown, which limits the interpretation of the feature. Five of them are charred, and the three plants that produced them (*Chenopodium* sp., *Opuntia* sp., and *Madia sativa*) can all be linked to Mixtec pre-Hispanic foodways. The fact that they are charred leads me to believe that they were cooked and got preserved this way.

The other identified seed found in this sample is not charred and comes from the *Panicum virgilatum* species, which is not linked with foodways in ethnohistoric and ethnographic literature. I believe the presence of this seed is due to contemporary contamination rather than an archaeological specimen. I explain this by the fact that nearly all the seeds recovered in this research are charred. This seed is one of the very few non-charred seeds and the only presence of *Panicum virgilatum* found in all the paleoethnobotanical samples, which makes me very cautious in integrating it in my analysis. As mentioned by Pearsall (2015:36–37), modern seeds can end up in light fractions, blown by the wind, “accidentally kicked into excavation pits”, or buried by worms, roots, and animals. Pearsall recommends discarding non-charred seeds when the assemblage is mostly charred and when the two differ greatly. Because it is the only non-charred seed and the only one not linked to traditional Mixtec foodways found in this archaeological context, I do not consider it in my interpretation. I maintain its presence in the tables across the research, but I am fairly confident this seed is a contemporary contaminant.

The five remaining seeds can all be linked to traditional Mixtec foodways. With the limited number of specimens found and the absence of any microbotanical remains linked with those plants, it is hard for me to establish how these three plants were consumed. Mixtec people probably accidentally dropped them into the fire while preparing or eating their meal. Given that the ash pit is linked with an activity involving the production of a great amount of ashes rather than a midden (Forde 2015:176–179), it is very plausible that ashes from other activities that occurred around the patio might have ended up in the pit as well. I believe that the botanical remains came from a fire pit that was cleaned out, and the ashes were discarded in this pit already filled with ash.

Structure 1 and Patio, Terrace 13 North

I combine the results obtained from the large residential building (Structure 1) (FS 1322) and its patio (FS 2893). There were seven seeds recovered in total from those two samples, all charred, one of them unknown (Table 6.2). In this section, I introduce two new plant families and one new genus: Fabaceae, Poaceae, and Polygonaceae: *Polygonum* sp.

Table 6. 2: Structure 1 of Terrace 13 and patio paleoethnobotanical results

Number of seeds	**Family**	**Taxon**
1	Asteraceae	*Madia sativa*
1	cf. Cactaceae	*Opuntia* sp.
1	Chenopodiaceae	*Chenopodium* sp.
1	cf. Fabaceae	Fabaceae sp.
1	cf. Poaceae	Poaceae sp.
1	Polygonaceae	*Polygonum* sp.
1	UNK4	

Fabaceae sp.

The Fabaceae (Bean) family is very large. It is mainly known for domesticated beans (Fabaceae *Phaseolus* sp.), an important part of the Mixtec and Mesoamerican diet. The paste of the common bean is often added in Oaxacan dishes, such as *memelitas* or *tlayudas*. Huaje, the plant that gave its name to the Oaxacan state, also from the bean family, is used as flavouring to accompany *empanadas* for example. The fruits from this family are usually a legume (Cornejo and Janovec 2010:58). There are 1953 known species in Mexico (Ibarra-Manríquez et al., 2015:148). I was not able to confirm if this specimen was a bean or not, as its distinctive features were gone. I believe it is plausible it is a bean due to its overall shape, but it is safer to simply stay at the family level.

Poaceae sp.

The Poaceae is another very large family, with 1,187 species known in Mexico (Ibarra-Manríquez, et al. 2015:248). It is usually associated with herbs and cereals. The best-known members of this family are maize, wheat, barley, and rye. The specimen I recovered from this sample shows the distinctive traits of this family, with its envelope clearly demonstrating its appurtenance to the Poaceae realm.

Polygonaceae: *Polygonum* sp.

The different species associated with this genus vary from herbs to shrubs that can reach one metre in height. This plant requires a lot of water to grow and is common in aquatic fields. It is present in Mexico and Europe and is usually considered a weed (Cornejo and Janvoec 2010:113–114). Its presence in this sample might indicate the presence of a humid environment near the terrace. This could demonstrate the success of the *lama bordo* terrace system in storing water, providing enough to allow this plant to grow. This plant could also have been taken elsewhere and brought back to the terrace for uses I cannot identify as of now.

Terrace 13 Structure 1 and Patio: Interpretations

The following interpretation is based on the six identified seeds from Terrace 13, two of them only to the family level. As mentioned earlier, the cf. Fabaceae sp. seed could be linked with foodways, while the cf. Poaceae sp. seed could come from a multitude of different grasses and weeds. The presence of the Polygonaceae: *Polygonum* sp. informs us about the presence of a more humid sector in proximity to Terrace 13, but the plant is not directly linked with foodways in the Mixteca Alta. The three other seeds (*Madia sativa*, *Chenopodium* sp., and *Opuntia* sp.) were all present in the ash pit of Terrace 13 and are all associated with Mixtec pre-Columbian foodways. In a residential context, these plant remains conform with expectations given ethnohistoric and ethnographic literature regarding these plants.

Table 6. 3: Combined paleoethnobotanical results of Terrace 13

Taxon	LF count F21	SG count F21	LF count S1 and patio	Total
Madia sativa	1		2	3
Opuntia sp.	1		2	3
Chenopodium sp.	1		1	2
Fabaceae sp.	1			1
Panicum virgilatum			1	1
Poaceae sp.	1			1
Polygonum sp.	1			1
UNK1			1	1
UNK2			1	1
UNK3			1	1
UNK4	1			1
UNKS3		1		1
UNKS4		1		1

Note: LF = Light fraction botanical remains, SG = Starch grains, UNK = Unknown, UNKS = Unknown starch

The six paleoethnobotanical samples coming from Terrace 13 all probably date from the Colonial Period or later (Table 6.3). As it is possible to see in Table 11, only three species are present in both contexts: Astereceae: *Madia sativa*, Cactaceae: *Opuntia* sp., and Chenopodiaceae: *Chenopodium* sp. These three species are linked with pre-Columbian foodways, and their presence in a colonial context demonstrates that Mixtecs occupants of Terrace 13 kept using these plants after the Spanish conquest. There is no identified introduced plant from Europe, which, combined with the presence of pre-

Columbian foodways plants, could point towards a continuity in the Terrace 13 Mixtecs' diet. With only 12 seeds identified out of these five samples, I cannot confirm without any doubt that the Mixtec did not include any introduced species in their foodways. I can, however, point towards the idea that Mixtec inhabitants of Terrace 13 did maintain a diet similar of the one they had before the arrival of Spaniards, with plants such as tarweed and *tuna* cactus. The microbotanical results did not provide much more information. The two starch grains recovered were damaged, which might be due to an exposition of the artifact to high temperatures, but I would need more starch grains to confirm this idea.

The two archaeological contexts analyzed were not directly linked to foodways, which limits the number of seeds recovered. The excavations at these two locations targeted general household activities and craft production, so we would not anticipate high quantities of charred remains associated with foodways. If the excavations of Terrace 13 led to the discovery of a midden, a hearth, or distinct areas of food processing and consumption, more results likely would have been obtained. However, these results are interesting nonetheless, and combined with those of Terrace 10 can provide us with a better understanding of the foodways continuities and changes that might have occurred at San Miguel Achiutla.

Terrace 10: multiple occupation periods

Unlike Terrace 13, which consisted only of Colonial Period samples, Forde has categorized the samples from Terrace 10 into four time periods (Forde 2017b): Postclassic, Postclassic/Colonial, Colonial, and Colonial or later. I divide this section the same way, in order to get a better understanding of continuities and changes in the foodways of Mixtec occupants of Terrace 10. Within this area, nine features were analyzed: a Postclassic midden (F43), a sub-floor of the South Structure, a ring of stone at the patio (F44), a Colonial midden (F43), a storage located in the South Structure (F23), a hearth located in the South Structure (F24), a fire pit located in the West building (F42), a fire pit located at the East portion of the patio (F45), and one microbotanical sample came from a slopewash (FS 3184) (See figures 6.3–6.5).

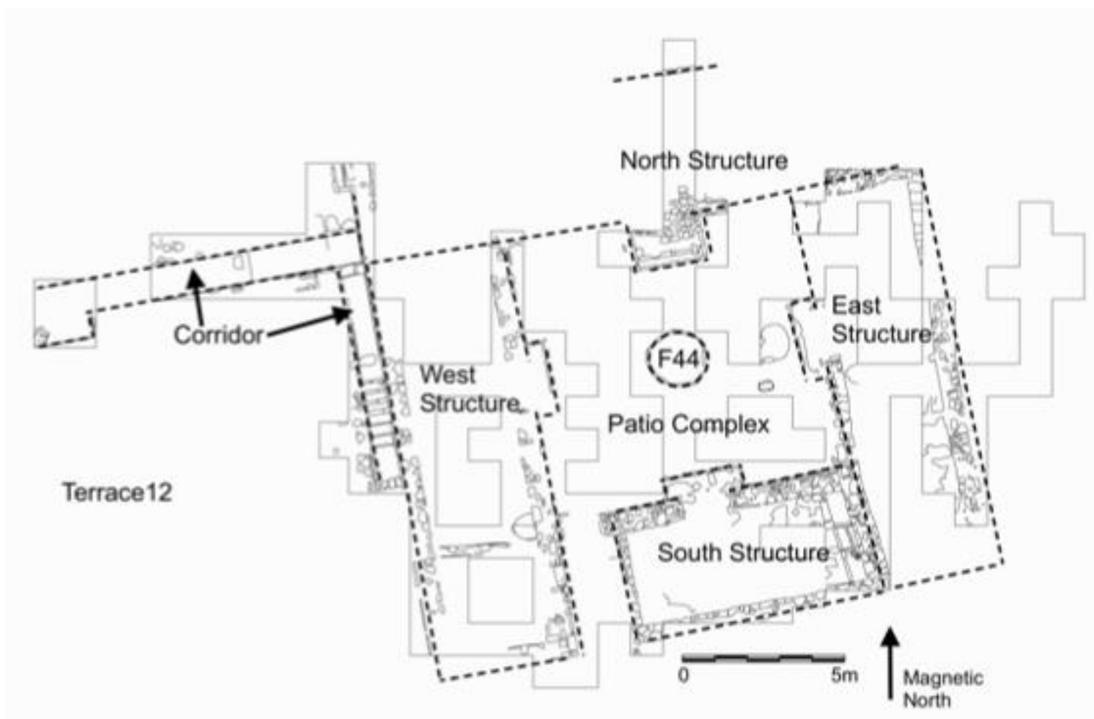


Figure 6. 3: **Plan of Terrace 10. F44. (Forde 2015:199)**

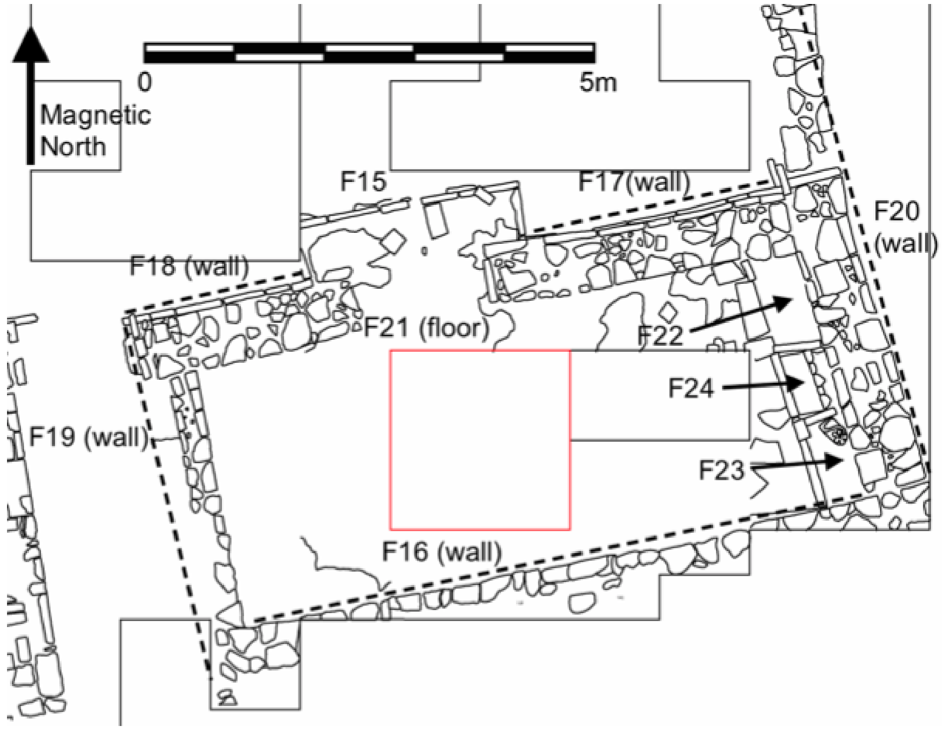


Figure 6. 4: Plan of South Structure. F23, F24, sub-floor in red (Forde 2015:204)

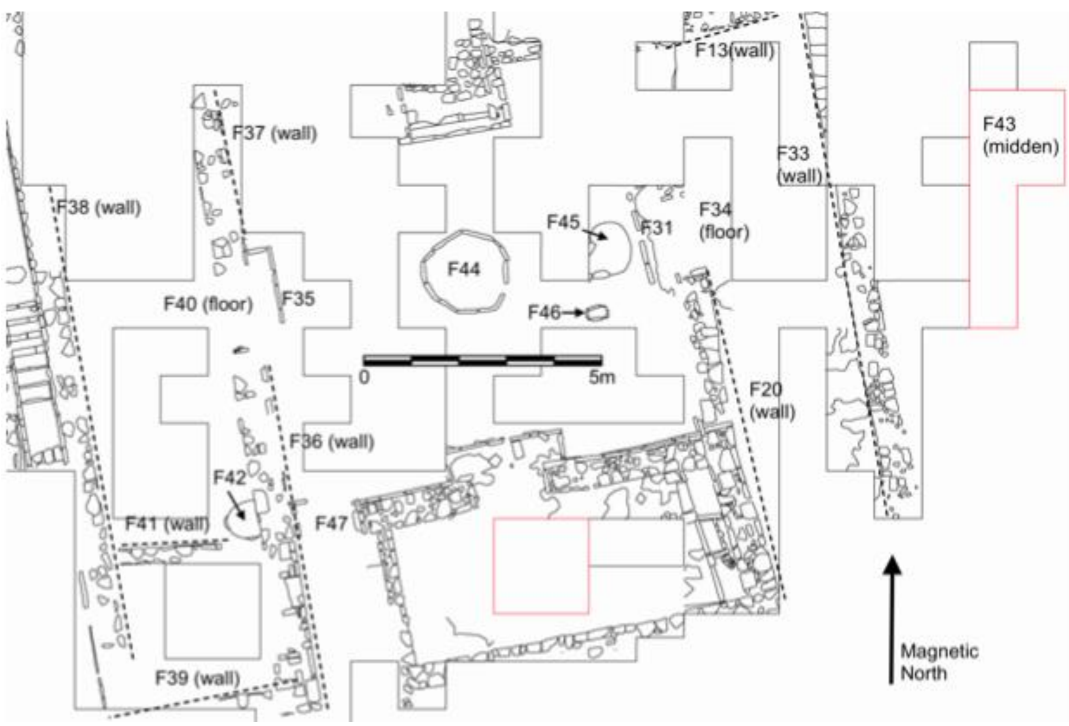


Figure 6. 5: East and West Buildings. F43, F42, F45 (Forde 2015: 212)

Postclassic Period: Midden context in Terrace 10

Five samples (FS 3178, 3154, 3176.1, 3176.2, and 3171.1) probably date to the Postclassic Period. They were all recovered from a single midden, along with bones of turkey, white-tailed deer, dog, rabbit, and birds (Forde 2015:295–297). I further recovered a ceramic sherd, two lithic tool fragments, and a few bones from the light fraction. In Table 6.4, I compile all the paleoethnobotanical remains identified in those samples.

Table 6. 4: Combined results of the Postclassic midden, Terrace 10

Taxon	LF count	SG count	Total
Cactaceae sp.	6		6
Cheno/Am sp.	11		11
Chenopodium sp.	1		1
Opuntia sp.	1		1
Scirpus sp.	1		1
Zea mays	6	2	8
UNK5	1		1
UNK6	1		1
UNK7	1		1
UNKS1		3	3
UNKS2		1	1

Note: LF = Light fraction botanical remains, SG = Starch grains, UNK = Unknown, UNKS = Unknown starch

Below, I describe the economic and dietary uses of the *Amaranthus* sp., the Cactaceae family and the Cyperaceae: *Scirpus* sp.

Amaranthaceae: *Amaranthus* sp.

The *Amaranthus* sp. seeds can look very similar to *Chenopodium* sp. seeds depending on the preservation and the charring levels. The category "Cheno/Am" incorporates the two genera together and is a sort of catch-all category. Amaranth, when eaten as a green, is often called *huisquelite* or *quelite* (Ebeling 1985:682; Lentz and Dickau 2005:67). It is often cultivated in cornfields or found along roads and other open spaces (Lentz and Dickau 2005:67). Its leaves can be consumed as a green and the seeds can be prepared in different ways (Ebeling 1986:682–684). Its grain has a higher content of proteins than wheat, rice, and maize, and it can be ground into flour, or popped and mixed with honey or syrup (Ebeling 1986:682–684). Finally, amaranth grains can be mixed into porridges or used as a sort of crunchy condiment (Dressler 1953:121–122; Ebeling 1985:682; Lentz and Dickau 2005:67).

Cactaceae spp.

This family is composed of "terrestrial herbs and shrubs of dry areas" (Cornejo and Janovec 2010:34). There are 946 different species in Mexico, many of them used as ornaments or eaten (Ibarra-Manríquez, et al. 2015:90). It is difficult to assess in this sample if the seeds found were used by Mixtecs in any way or if the reason they were found is due to the fact that cacti were present on Terrace 10 and around at that time. When I visited the site, there were many different types of cacti at the archaeological site, but their contemporary presence is not a proof of their presence a few centuries ago. The six seeds recovered did show signs of carbonization, which would confirm their archaeological provenience.

Cyperaceae: *Scirpus* sp.

This plant usually grows in humid environments or where soils retain enough water to support its growth (Marie-Victorin 2002:690–697). Today, this plant is considered ornamental by some people, although it is mostly considered as a weed (Simpson and Inglis 2001). It can also serve as food for cattle, but with this seed likely dating from the Postclassic Period, use is unlikely unless as food for other domesticated animals. As it was the case with the presence of Polygonaceae: *Polygonum* sp. seeds earlier, this plant is usually found in humid areas and is not linked with Mixtec foodways. I believe that the presence of these two plants is likely due to the fact that the soil retained more water near the terraces, giving an opportunity for these plants to grow. It is also possible these plants were retrieved elsewhere and brought back to Achiutla as decorations

Postclassic Midden Interpretations

This sample is really interesting, as it represents traditional Mixtec foodways to a high degree. This is the only context where maize was present. There were six macrobotanical and two microbotanical remains of *Zea mays*. Being at the centre of the Mixtec culture and foodways, it is surprising to notice limited presence at Achiutla, a point I explore further at the end of the chapter. The presence of bones associated with common species consumed by the Mixtec noble class—turkey, white-tailed deer, dog, rabbit, and birds— combined with the presence of maize, *tuna* cactus, and *Chenopodium* sp. and *Amanrathus* sp. (*pazote* or *apazote, huisquelite* or *quelite*), is exactly what I would have expected to find, considering these food items are well embedded in the Mixtec diet.

Considering the presence of these plants, I argue that the cacti seeds identified to the family could have been consumed as well. The paleoethnobotanical and zooarchaeological results support the idea that a good quantity of food remains were discarded in this midden, which could also have been the case with these charred seeds. This hypothesis would be better explored if the seeds were identified to the genus or species. The plant remains uncovered in this sample strongly support the Postclassic dating made by Jamie Forde, as they were all present in the region before the Colonial Period.

<u>Postclassic/Colonial Period: South structure and Stone Ring in Terrace 10</u>

Five samples probably date from the Postclassic/Colonial Period and come from two different contexts. FS 3106 and 1060 come from the sub-floor of the South structure, associated with the presence of a Postclassic ceramic brazier that might have been deposited as an offering. The three other samples (FS 2001.1, 2001.2, and 1892) come from the ring of stone found in the central patio of the residential building. As mentioned earlier, it could have been built to recreate the famous circle found in the Spanish religious architecture, placed at the center of "courtyards or cloisters in Catholic convents of 16th century Spain and Mexico" (Forde 2015:217).

The sub-floor of Terrace 10 South structure

Jamie Forde (2015:207) identified two earlier construction phases under the floor. While digging, the excavating team found a Postclassic ceramic brazier under a stone alignment, which might have been an offering, although not enough information has been retrieved to confirm this hypothesis (Forde 2015:208).

Table 6. 5: Macrobotanical results from the sub-floor of Terrace 10 South Structure

Number of seeds	Family	Taxon
1	Asteraceae	*Madia sativa*
1	Chenopodiaceae	*Chenopodium* sp.
5	Clusiaceae	*Vismia* sp.
1	Poaceae	*Panicum* sp.
3	cf. Poaceae	Poaceae sp.
1	Solanaceae	Solanaceae sp.

Several seeds were recovered from this context (Table 6.5). Below, I describe in detail the traditional uses of Clusiaceae: *Vismia* spp., Poaceae: *Panicum* spp. and introduce the Solanaceae family.

Clusiaceae: *Vismia*

The Clusiaceae *Vismia* sp. (manduro) seeds come from a tree than can grow as high as 15 m and that produces a berry 1.5 cm in diameter, which itself contains many seeds (Cornejo and Janovec 2010:42). This tree is generally found in disturbed forests and is often present in Mexico (Cornejo and Janovec 2010:42). The species *Vismia guianensis*, one of the most common, is not edible but is consumed by bats and birds (Rios, et al. 2004:160). One seed of *Vismia* sp. was found in the only sample coming from Terrace 1, which could be older than the Postclassic Period, demonstrating the presence of this vegetal species at Achiutla before colonial times.

Poaceae: *Panicum*

This genus was present around the globe before the Colonial period, which makes it difficult to assess if the seed is coming from a plant native to the Americas, or was introduced by Europeans. As mentioned earlier, the Poaceae *Panicum virgilatum* identified in an earlier sample was present in Oaxaca before the Spanish Conquest and mostly served as a way to improve grassland, when not considered a weed. Other species, such as the P*anicum capillare*, the *Panicum coloratum*, and the *Panicum hallii* played a similar role (Valdés Reyna 2015:382–397). An interesting native species, *Panicum panizo*, was present before the Colonial Period and is very often found in maize and bean fields (Valdés Reyna 2015:388–389). Other *Panicum* species were introduced from Asia and Australia in order to feed sheep and cattle, animals introduced in the New World as well during the Colonial Period (Valdés Reyna 2015:382–397). With the presence of two cow bones dating from the Colonial Period on this terrace and historical texts mentioning the presence of sheep at Achiutla (Forde 2015:295–297), I cannot rule out the idea that this plant was introduced in order to feed cattle and sheep. Therefore, I cannot establish definitively if this plant is a native of the New World or introduced from Europe.

Solanaceae family

The Solanaceae (nightshades) family includes many important food items from the Mixtec diet, such as tomatoes and chile peppers. There are 430 different species from this family identified in Mexico (Ibarra-Manríquez, et al. 2015:297). The seed found in this sample has the same surface than many seeds of this family, but I was not able to find a matching seeds in the reference collections I used.

Sub-Floor of the Terrace 10 South Structure: Interpretations

Except for the two seeds of *Madia sativa* and *Chenopodium* sp., the seeds retrieved cannot be directly linked with foodways. The *vismia* sp. seeds seem to confirm the presence of this tree in the vicinity, when combined with the results from Terrace 1, and from the other samples of Terrace 10 where it can also be found. The Poaceae sp. seeds found, including the *Panicum* sp., inform us of the presence of grasses in the vicinity. Unfortunately, these results cannot shed better light on the archaeological context of the sub-floor. The seeds present could have fallen there by accident or come from grasses trapped under the floor. The small number of edible seeds indicates the possibility of a storage use, and there is no plant species associated with spiritual beliefs to go along with the offering hypothesis. The sample is mainly composed of native species. The Poaceae sp. seeds could come from a native or introduced species, as I was not able to identify them precisely enough. The fact that the artifacts retrieved in the sub-floor date from the Postclassic Period, and that the seeds that accompany them were all present in the Postclassic Period as well, makes me believe there is a greater chance these seeds all come from the region, including the *Panicum* sp. seed. Without any additional evidence of European artifacts or plants, I maintain a conservative interpretation when inferring the origins of the paleoethnobotanical remains.

Feature 44: Terrace 10 ring of stone

This ring was placed in the centre of the plaza and its function is still unknown (Forde 2015:214–219). While excavating it, Jamie Forde and his team found many flakes obtained from obsidian debitage, which probably occurred around the area and later got discarded there. Forde (2015:217–218) believes this architectural feature is not found elsewhere in the pre-Hispanic sites of the region, which might mean it is influenced by the Spanish religious architecture.

Table 6. 6: Macrobotanical results from Feature 44 (ring of stone)

Number of seeds	**Family**	**Taxon**
1	Brassicaceae	*Lepidium* sp.
46	Cheno/Am	*Cheno/Am* sp.
6	Cyperaceae	*Scirpus* sp.
62	UNK1	
1	UNK9 (Grain)	

From this sample, only one identified seed has not yet been described: Brassicaceae, *Lepidium* sp. I will briefly explain how this plant could be consumed, before analyzing the results altogether.

Brassicaceae: *Lepidium* sp.

Lepidium sp., or peppergrass, is an herb found in “shaded places”, and is now present along roads, fields, and is often considered a weed (Lentz and Dickau 2005:86). The seeds and the flower can be consumed. It tastes like chile and is often used to flavour meat or other meals in Northwestern Mexico (Ebeling 1986:777). It can be eaten either dried or raw. According to Ebeling (1986:777), the flower is the part of the plant the strongest spiciness resides. One of the species in this genus, *Lepidium virginicum,* is commonly named peppergrass (Lentz and Dickau 2005:86). This plant might have been used in the *Mixteca* region as well to flavour meats, although I am not aware of its use in today’s Mixtec foodways.

Terrace 10 Feature 44: Interpretations

There are more than 100 charred seeds in this context, including 47 potentially edible ones (*Lepidium* sp., *Chenopodium* sp., and *Amaranthus* sp.). The circular stones do not show any trace of exposition to heat, and the number of charcoal fragments recovered is not very high, which invalidates the possibility of a hearth pit. I believe that these seeds come from fire pits located near the feature that were discarded into the ring, along with the small artifact fragments and the high quantity of debitage. Although people discarded small artifact fragments, including residue from obsidian knapping and ashes from fire pits, the primary function of the stone circle is probably not a midden. Archaeologists would have found a greater amount of artifacts during excavations, were this a primary midden context. The exact nature of this circle remains hypothetical, but the identification of the 62 seeds of UNK1 could be the key. If these seeds were to come from a tree species, it would be interesting to investigate the idea that this circle held a tree. As mentioned before, Achiutla was the home of two sacred trees. Unfortunately, the exact location of those trees remains a mystery. I do not believe that this circle would have held one of the two trees, as I believe it would have been more likely to find those trees in the rulers' palace rather than at the house of a noble family. The stone circle is located in the middle of the central plaza of Terrace 10, at the core of the residential unit. With the location of the plaza and the potential religious symbol associated to this archaeological feature, I believe that it must have had a special meaning for the occupants of Terrace 10. Could the stone circle have been a way to integrate a tree, an important feature of the Mixtec religious beliefs, into a Spanish religious architectural complex? I will not elaborate more here, but I hope to be able to identify these seeds and confirm or falsify this idea.

Sub-floor and Stone ring (F44) combined results: Postclassic/Colonial Period

Interpretations

These two features are the only ones probably dating from the Postclassic/Colonial period. The sub-floor was excavated in the South Structure, while the ring of stone is located at the centre of the plaza, providing the opportunity to examine plant remains coming from different parts of Terrace 10.

Table 6. 7: Macrobotanical results from the Postclassic/Classic Period, Terrace 10

Taxon	LF count sub-floor	LF count F44	Total
Cheno/Am sp.		46	46
Chenopodium sp.	1		1
Lepidium sp.		1	1
Madia sativa	1		1
Panicum sp.	1		1
Poaceae sp.	3		3
Scirpus sp.		6	6
Solanaceae sp.	1		1
Vismia sp.	5		5
UNK1		62	62
UNK9		1	1

Note: LF = Light fraction botanical remains, UNK = Unknown

In these macrobotanical samples dating from the Postclassic/Colonial period (Table 5.7), all the plants identified are native to the region, although there are certain species of *Panicum* that were introduced in Mesoamerica during the Colonial Period. Two types of seeds clearly dominate these samples: *Chenopodium/Amaranthus* sp. (47) and UNK1 (62). Unfortunately, the fact that UNKN1 is unidentified makes this assemblage harder to interpret. Maize is absent from these contexts, perhaps replaced by another seed, UNK9. Present in only one sample and fragmented, this seed is impossible to identify. Even if maize disappears from the archaeological assemblage, I believe it is likely they kept eating it, as there are no traces of wheat or any other substitute for it. The consumption of *pazote/apazote* and *huisquelite/quelite* seems to continue during the Postclassic/Colonial period, showing some level of continuity with the previous time period, thus demonstrating some level of continuities between the two.

These archaeological contexts—a sub-floor and the unknown ring of stone—give only an indirect look at foodways, and the absence of the main core of foods of the Mixtec nobility (maize, beans, squash, and meat) makes interpretation more speculative. As the Mixtec nobility kept eating goosefoot (*Chenopodium* sp.), and given the absence of confirmed introduced species, it is likely they maintained the same foodways as those prior to Spanish Contact. An excavation focusing on areas associated with food preparation and consumption would shed more light on this possibility.

Terrace 10: Colonial Period

The Colonial Period is marked by the establishment of the new Spanish authorities and transformations of political (*cabildo)* system, the economy (*encomiendas*) and religion (evangelization). However, as I will demonstrate here, these changes do not seem to have impacted the Mixtec foodways at Achiutla. Seven macrobotanical samples and two microbotanical ones more securely date to the Colonial Period. Two of them did not contain any seeds: FS 2074 (F23, storage compartment, South Structure) and 2067 (F24, hearth, South Structure). The other samples (FS 779, 776, 243, 192, 789, 124, and 55) all come from a Colonial midden (Table 6.8).

Table 6. 8: Paleoethnobotanical results of Colonial midden, Terrace 10

Taxon	LF count	SG count	Total
Madia sativa	1		1
Asteraceae sp.	1		1
Cactaceae sp.	1		1
Cheno/Am sp.	2		2
Chenopodium sp.	2		2
Vismia sp.	1		1
Fabaceae sp.	1		1
Melinis repens	6		6
Eragrostis sp.	1		1
Poaceae sp.	2		2
Polygonum sp.	1		1
UNK1	1		1
UNK2	1		1
UNK3	1		1
UNK4	1		1
UNK10	1		1
UNK11	1		1
UNKS1		1	1
UNKS3		1	1
UNKS4		1	1

Note: LF = Light fraction botanical remains, SG = Starch grains, UNK = Unknown, UNKS = Unknown starch

Below, I briefly provide a general overview of the Asteraceae family, and complete this overview with a discussion of Poaceae: *Eragrostis* sp. and Poaceae: *Melinis repens.*

Asteraceae family

The Asteraceae family is "one of the largest and most variable" (Cornejo and Janovec 2010:21). It ranges from herbs and shrubs to trees that can reach 30 m in height (Cornejo and Janovec 2010:21). In Mexico, 3,021 Astereceae species have been identified (Ibarra-Manríquez, et al. 2015:63). *Madia sativa*, a plant described earlier in this chapter, comes from the Asteraceae family.

Poaceae: *Eragrostis* sp.

This genus combines native plants of the New World and introduced species from Europe, Africa and Asia (Lentz and Dickau 2005:11; Valdés Reyna 2015:252–273). Some of the native species (E. *amabilis*, *E. curtipedicellata*) are now considered weeds, while others are used to feed animals (E.*intermedia*) or are used for the creation of ornaments (E.*spectabilis*) (Lentz and Dickau 2005:11; Valdés Reyna 2015:252–273). The introduced species range from weeds (E.*barrelieri*, *E.cilianensis*) to food for cattle and sheep (E.*curvula*) or as a way to control erosion levels in the South of the USA (E.*lehmanniana*) (Valdés Reyna 2015:252–273). It is now found growing wild along roads, in cities, and in many gardens throughout Mexico (Valdés Reyna 2015:252–273).

Poaceae: *Melinis repens*

This species originally comes from Africa or East Asia and was introduced during the Colonial Period as an ornament. It has not been considered part of Spanish or Mixtec foodways (Valdés Reyna 2015:334–335). Today, it is considered a weed (Valdés Reyna 2015:334–335).

Terrace 10 Colonial Midden: interpretations

The appearance of Poaceae *Melinis repens* is the first confirmed presence of introduced species in the archaeological assemblage. Five of these seeds are not charred, but one of them is fully carbonized. If all the seeds had been uncharred, I would have ruled out the archaeological provenience, believing the *Melinis* seeds present in the sample to be due to contemporary contamination. However, the presence of one charred seed leads me to believe that the seeds recovered are archaeological, and their presence demonstrates the existence of this species at Achiutla during the Colonial Period. The appearance of one seed tentatively identified as *Eragrostis* sp. could also be an indicator of the introduction of plants used to feed cattle. The two bones of cows found in the midden support this idea.

Thus far there is no introduced plant in the midden that can be linked to foodways. The presence of one possible seed of the Fabaceae family, combined with the Asteraceae *Madia sativa* and *Chenopodium/Amaranthus* sp. are constant with the results of the earlier time periods. Unfortunately, the preservation seems to be worse in the Colonial Period than the Postclassic midden, limiting our full understanding of the foodways of the Colonial Period. From the evidence available, European ornamental and grazing plants did make their appearance in Achiutla during the Colonial Period at Terrace 10, but none of those taxa were associated with Mixtec foodways.

Terrace 10: Colonial or Later Period

Three macrobotanical samples were dates as Colonial or later. They came from a fire pit located in the West building (F42) and from one other found in the Eastern portion of the terrace (F45). The fire pit found in the West building might be linked with a brief reoccupation, people having destroyed a section of the stucco floor to install it (Forde 2015:212–213). The fire pit found on the plaza led to the discovery of an "amorphous lead artifact" (Forde 2015:221**).** Only one of the three samples (FS 772), collected from F45, yielded three seeds, which are unknown (UNK4, UNK11) (Table 6.9), which limits the interpretation. F42 was probably occupied for a very short period of time, which might explain the absence of macrobotanical residues; the occupation having been too sporadic to leave enough plant remains to survive archaeologically. With the presence of lead debris in F45, it might be possible that this fire pit was linked with lead processing activities rather than cooking, which might also explain the absence of macroremains recovered from this feature.

Table 6. 9: Macrobotanical results for the Colonial period or later, Terrace 10

Taxon	LF count FS 2952	LF count FS 1963	LF count FS 772	Total
UNK4			2	2
UNK11			1	1

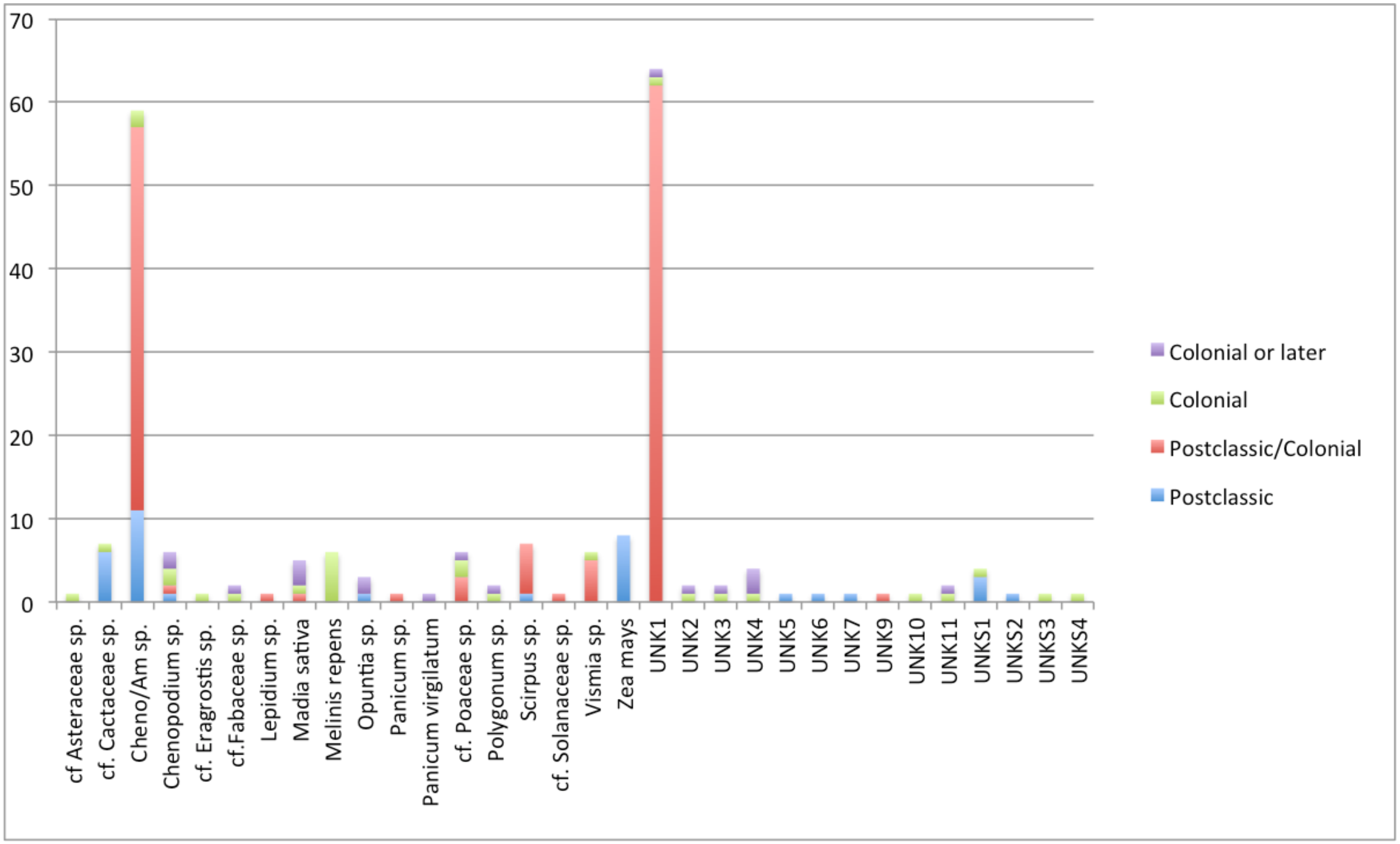
Mixtec Foodways: Continuity Through Time

When combining all the paleoethnobotanical results (Table 6.10), even given the preservation issues discussed in Chapter 7, it is easy to see that *Amaranthus* sp. and *Chenopodium* sp. dominate the assemblage, as they are present from the Postclassic through the Colonial Period. Maize is present during the Postclassic Period, but disappears from the following archaeological phases. The disappearance of maize does not, however, indicate that people stopped eating it. Combined with our historical knowledge of Mixtec foodways and the presence of maize during the Postclassic Period, it is very likely maize continued to be eaten at Terraces 10 and 13 during the Colonial Period. This continuity is supported by the fact that the inhabitants of Terrace 10 kept eating the same animals before and after the arrival of Spaniards, as confirmed by the zooarchaeological remains recovered from two middens dating to these two time periods.

I found what looks to be three grains (one of UNK10 and two of UNK11) in the Colonial and later archaeological periods. UNK10 looked very similar to chickpea, but experimental archaeology ruled out this identification. These plants could be introduced species, and could have played a role in Mixtec foodways. I compared these with wheat, barley, and rye seeds, and I did not find any variety that was close enough to provide me with a satisfying identification. As mentioned before, the historical texts mention the introduction of wheat in the region and to a lesser extent of barley, but no other cereal is mentioned (Hamilton 1929; Alves 1994; Spores and García 2007; Staller and Carrasco 2010; Earle 2012; Warinner et al. 2012). As these three grains are not wheat, nor barley, it could be possible they are native plants species that appeared later in the archaeological record.

The other introduced species, *Melinis repens*, was not edible and was likely used as ornament. There are no traces of any major Spanish foodways plants in the terraces related to Mixtec nobility, i.e. wheat, olive, pears, apples, or citrus. As discussed in Chapter 3, historical texts mention that nobles ate introduced plant species (Alves 1994:68), possibly in order to get closer to the Spaniards. It seems that it was not the case in Achiutla. I believe that the Mixtec inhabitants of Terrace 10 and 13 kept eating the foods their ancestors had eaten. Did they resist the Spaniards by eating the same foods? Did they have access to Europeans food items if they wanted to eat those? I reflect on these possibilities in the next chapter.

Table 6. 10: Paleoethnobotanical results by time periods



Chapter 7: Conclusions and Future Directions

My primary objective was to study the Mixtecs' reaction to the arrival of Spaniards by analyzing household foodways. Paleoethnobotany, when used to study what people ate, allows us to examine social dynamics, including the formation and modification of identities, and cultural transformations. By focusing on what people ate, we can study the meanings behind this act and its roots in different contexts, whether social, political, or cultural. It also enables archaeologists to study an everyday life activity and get a better understanding of the household dynamics. In the *Mixteca Alta* region, a study demonstrated that the local diet remained the same at Yucundaa Teposoclula, even if the commoners had to grow wheat to pay tribute to the Spaniards (Warinner et al. 2012). At Yucuita, archaeologists found carbonized wheat, peaches and prune in Mixtec occupation areas, although the social status of its occupants was not established; if the occupants were of non-elite status, this would demonstrate the incorporation of these Spanish foods into the Mixtec diet (Smith 1976; Spores and Robles García 2007: 350). Finally, at Yanhuitlan, zooarchaeologists were able to identify bones from pigs, sheep/goats, cows and chickens (Spores and Robles García 2007:348–350). With some regional archaeological sites demonstrating the presence of introduced European plants and others showing its absence, I found it difficult to predict which results I would obtain at Achiutla

In this paleoethnobotanical research, I analyzed a total of 22 macro and 5 microbotanical samples collected at San Miguel Achiutla. Using these samples, I was able to compare Mixtec foodways during the Postclassic and the Early Colonial Periods and identify possible continuities and differences over time. My focus was on the foodways of Mixtec nobles, as all the samples came from two terraces probably occupied by *tay toho*, or Mixtec nobility. The samples analyzed came from different archaeological contexts, some directly associated with foodways, while others came from architectural features. The paleoethnobotanical samples were collected and analyzed to enhance the archaeological knowledge of the site, and support or falsify hypotheses developed around the function of different structures and features based on other artefactual evidence.

Paleoethnobotany has demonstrated an effective method in addressing larger questions in colonial archaeology. The inclusion of environmental evidence in research of colonial sites in Mesoamerica is still very rare, and when carried out, it is generally the study of fauna through zooarchaeology. My study combines the zooarchaeological research completed by the biologist Silva Pérez Hernández with the paleoethnobotanical research I carried out. By looking at the combination of animals and plants consumed by Mixtec nobles, it is possible to get a better understanding of the foodways of Achiutla's people. A study of insect remains recovered, entomo-archaeology, would complete the Mixtec foodways circle, as insects played a key role in Mixtec foodways, and many insects are still present on the table in Oaxaca.

Spanish conquistadors and colonists had many goals when they engaged in the colonization of the Americas. As mentioned earlier, some saw it as a way to get richer, some to get access to more territory, others as a way of competing with Portuguese rivals, and many were motivated by some combination of the above. Spanish religious orders took a great interest in the colonization of the Americas and quickly got involved in the evangelization of Indigenous groups, seeking to provide them access to heaven or press them into service for the church. The arrival of Spaniards in the Americas was accompanied by episodes of violence, and many deadly contagious diseases that spread throughout the Americas, decimating Indigenous communities across the continent.

Beyond the movement and decimation of populations, Spaniards also had an impact on Indigenous lifeways. By trying to gain control of economic, political, and religious spheres, Spaniards tried to take control of Indigenous cultures themselves. Although the Spanish Conquest seems to have been relatively peaceful at San Miguel Achiutla, historical documents demonstrate the struggles Spaniards had with gaining full control over Mixtec lifeways (Romero Frizzi 1996:196; Pérez Ortíz 2009; Forde 2015:7, 79)

Achiutla, once integrated in the *encomienda* system, on paper came under the economic control of the *conquistadores* who were given entitlement to collect tribute, both in goods and labour. This economic system kept the Mixtec hierarchy already established, with the ruling elites, nobles, and commoners, but inserted a new apex of Spaniards, who collected tax, tribute, and labour.

In the political sphere, Achiutla was given a *cabildo*, or a town council. At its head were a governor, an *alcalde mayor*, and other Spaniards. The role of the *cabildo* was to supervise the Mixtec ruling elite that remained in place and ensure the functioning of the economic sphere. Rather than transforming the Mixtec political system, Spaniards decided to create a new entity that could examine and intervene in the Mixtec politics when judged important to do so, such as refusing to pay tribute or after acts of revolt.

In the religious sphere, Catholicism became the only allowed religion, meaning the Mixtec religious traditions were banned. As mentioned before, Mixtecs throughout the *Mixteca* were trialed after being caught performing ancient rituals (Joyce 2010:56; Forde 2015:318). The Mixtec occupants of Achiutla challenged the religious order several times, according to historical texts (Forde 2015). Friars were threatened and one was even imprisoned. One lieutenant of the *alcalde mayor* was imprisoned, and eventually the same fate happened to the *alcalde mayor* himself. After these examples of public resistance, the Spanish authority decided to give "minor punishments", as a way to appease the tensions (Forde 2015:79).

With the limited amount of historical text that treats everyday life of the Mixtecs of Achiutla, we can only guess how they reacted to the newly established colonial power, whether in the public sphere or in their homes. By looking at the plant remains recovered, this research provides an in-depth look into daily activities, which are not described in historical accounts. The plant residues of daily activities provide us with the opportunity to explore other dimensions of Mixtec lifeways, in particular foodways. In turn, foodways can help to shed light on interactions between the Mixtecs and the Spaniards.

San Miguel Achiutla was located at the very periphery of New Spain. Far from major colonial centres, Spanish authority was less present at Achiutla, forcing Spaniards to rely on Mixtec co-operation, both in the public and private life. This geographic distance also means that the amount of historical texts describing the *cacicazgo* of Achiutla and the life of its people is limited. There is nearly no information about the number of Spaniards and friars who lived in Achiutla or about the tribute collected by the *encomenderos.* For this reason, the archaeological and historical knowledge of the broader region, principally foodways, allows us to link paleoethnobotanical results to general lifeways of Mixtec people.

The foodways of Mixtec nobles was based on three primary cultivars: maize, beans, and squash (Cook and Borah 1968:9; Joyce 2010:51). They also had access to other plants, such as chenopodium and amaranth, grains that could be ground into flour or toasted. Other wild plants completed the menu, with wild game (white-tailed deer, rabbit, birds, etc.), along with important protein intake from insects and domesticated turkeys. The idealized diet of the Spaniards included meat (sheep, cow, chicken), wheat bread, and olive oil, with fruits such as pears, apples, and citrus.

Archaeological and historical records attest to the impacts each of these cultural paradigms had on the other. When Spaniards were first exposed to the new people of the Americas, they tried to account for differences at least partially by hypothesizing the role of foodways (Earle 2012:19). Spaniards believed that the people they encountered were different because of the environment, the climate, the water, and the food they were exposed to (Earle 2012:21–22). For some Spaniards, keeping an Iberic diet became a critical way to remain Spanish. As discussed in a previous chapter, Spaniards believed that, by modifying their foodways, they might lose their beards, which was believed to be linked with the ability to procreate (Earle 2012:24).

Spaniards might also have believed that modifying Indigenous foodways would be an important thing to do, given their religious ideas surrounding certain foods. Spanish friars believed that eating wheat bread was a key way to connect with God, even at home, given the symbolic connection between the wheat-based communion host and the actual body of the Christian God. Therefore, in order to convert the Indigenous people, Spanish priests had to incorporate wheat.

It is unclear to what degree Spaniards tried to modify Indigenous foodways. Archaeological and historical data vary greatly throughout the Spanish colonies. At St. Augustine (Bushnell 1991), in *La Florida*, or at Cruz Pampa, located in the Andes (De France 2012), historical and zooarchaeological studies have demonstrated that Indigenous diets remained based in local foods. In a contrary example, at Potosí, also in the Andes, the zooarchaeological remains found depended largely on species of European origin, although these food items might be linked with the wealthy Spaniards, who could afford to buy food from the neighbouring markets (De France 2012).

In the *Mixteca* region, different archaeological excavations have led to the identification of European-introduced species. At Yanhuitlan, archaeologists have found bones from pigs, sheep/goats, cows, and chickens (Spores and Robles García 2007:348–350). At Yucuita, remains of carbonized wheat, peaches, and prunes were identified (Spores and Robles García 2007:350). At Yucundaa, Warinner and her team (2012) completed an isotopic analysis of Mixtec bodies found in a cemetery dating from the Colonial Period. Although historical texts mention that the tribute at the cacicazgo of

Yucundaa was paid in part in wheat, Mixtec foodways were based on C4 plants, maize and amaranth, rather than wheat, a C3 plant.

My research combined results from two terraces and covered four archaeological time periods: Postclassic, Postclassic/Colonial, Colonial, and Colonial and later. The results obtained during the Postclassic Period represent the traditional Mixtec diet well. Maize is present both at the macrobotanical and microbotanical samples. This staple is combined with other important plants in the Mixtec foodways, such as the *Opuntia* sp. (*tuna* cactus fruit) and *Chenopodium* sp. grains (*pazote, apazote*). The results obtained for the Postclassic/Colonial period are very similar to those obtained for the previous period. Maize disappears from the archaeological record, but another edible plant, *Madia sativa* (tarweed, Chili tarweed) makes an appearance, along with various non-food plant species associated with grasses and shrubs. *Opuntia* sp., *Amaranthus* sp. and *Chenopodium* sp. are still present at this time period. During the Colonial Period, *Amaranthus* sp. and *Chenopodium* sp. are still very present, with the addition of unknown seed (UNK1) that does not come from one of the main European food items introduced in the region at that time.

All the plant residues recovered demonstrate that Mixtec people kept many of the same foodways during this transitional period, with the absence of any introduced species in paleoethnobotanical samples. The Colonial samples all come from a midden, where two bones of cows were identified. These two bones showed different signs of erosion than the other bones found in the midden, which led the biologist Pérez Hernández (Forde 2015:295–297) to believe that they might be due to a second deposition. Without any butchery traces on the bones, it is impossible to establish that these bones come from a cow that was consumed, but the evidence does show that there were cows in Achiutla at that time. Combined with the historical data mentioning a lawsuit in Achiutla about sheep eating and destroying plants in neighbouring fields (Forde 2015), it is safe to mention that these introduced animals made their way into the *cacicazgo* around that time period. However, there were no traces of consumption of these animals at the two terraces analyzed.

For the next two time periods, a new plant, *Melinis repens*, makes its way in the archaeological record. This species, introduced from the Old World, was not consumed, but rather used as ornament. It is the only confirmed introduced plant species in the archaeological assemblage. *Madia sativa* and *Chenopodium* sp. are still present in the macrobotanical samples for this time period, demonstrating continuity with the previous time periods. Three unidentified grains might come from introduced plants, but do not come from wheat or barley, the two plants mentioned in historical texts. Given the results obtained, it looks like none of the Spanish plants made their way into Mixtec foodways during the Early Colonial Period, although the analysis of the remaining paleoethnobotanical samples could provide a better understanding on the broad array of plants consumed.

I had four main objectives in mind when I started this research. First, I wanted to establish a baseline of Mixtec foodways at Achiutla during the Late Postclassic Period. As mentioned before, chenopodium was the main plant associated with their diet during this time period, along with *tuna* cactus and maize. With the evidence of consumed rabbit, white-tailed deer, and birds, these foods represent expected results for the region in terms of Mixtec nobles' foodways during the Postclassic Period.

My second objective was to determine to what extent Mixtec people incorporated new foods into their daily lives after the arrival of the Aztecs and the Spaniards. Thus far, I have no evidence of any European or exotic Aztec plant making its way into Mixtec foodways during the Early Colonial Period. Without any paleoethnobotanical data supporting the idea that the occupants of Terraces 10 and 13 might have incorporated new foods into their diet, I believe it is likely they kept foodways similar to the ones of their ancestors.

Third, I assessed to what extent Mixtec people abandoned traditional foods or prior foodways. Although maize disappears from the archaeological assemblage after the Postclassic Period, I do not believe that Achiutla's nobles stopped consuming this food item. Without finding any other cereal grain that might have replaced it, I believe the Mixtecs kept eating it and that its absence is due to preservation issue. This plant played a symbolic role for the Mixtecs and was an important foodstuff, which makes me doubt about the possibility that Mixtecs abandoned this vital food source.

Finally, I wanted to determine, given the paleoethnobotanical evidence available, to what extent Mixtec people of Achiutla upheld their culinary traditions. Given the combined results of my study, it appears as though Mixtec people upheld their traditions and kept consuming the same foods they did before the arrival of Spaniards in the region. Without the appearance of any introduced food species, I must rule out any interpretation using hybridity in this research, as their recipes likely remained the same. A future study examining and comparing the vessels used to cook and consume food during the Postclassic and the Early Colonial Periods might provide the opportunity to use the hybridity theoretical framework, but this was not the focus of this research.

By keeping their traditional foodways, did the Mixtecs resist Spanish authority? Using the term "resistance" does not adequately capture the dynamics of the Colonial time period. As I argue above, motivations behind possible acts of resistance must be assessed in order to determine, in an archaeological context, whether active resistance is in play (Hodder 1984; Brown 1996; Given 2004; Beck et al. 2010; Deagan 2010). In this case, there are no sources, either historical or oral, that allow me to understand the full dynamics in place at Achiutla during the Early Colonial Period. It is difficult to ascertain if pressures were placed on Mixtec people to modify their foodways, and if so, to what degree this was actively resisted. It is possible the friars living in the *convento* tried to include wheat in the Mixtec diet; it is also possible they did not. I have come up with four different scenarios that might explain the absence of any European edible plants at Terraces 10 and 13.

According to historical texts, there were great tensions between the Spanish friars and some occupants of Achiutla, especially at the beginning of the Early Colonial Period (Forde 2015). One friar was even imprisoned without access to food and water and might have died if it was not for friendly neighbours that found a way to pass him food (Burgoa 1934:330–331; Forde 2015:8, 78–79). According to Burgoa (1934), the relation between Achiutla's people and Spanish religious authorities got better with time, but relations were clearly tense at the beginning of the Spanish friars' entrance. Mixtec traditional religious beliefs were banned and replaced by new beliefs and practices, along with other enormous impacts on the Mixtec identity, economy, and politics. It is possible that the Spanish friars tried to force the Mixtecs into cultivating wheat for communion bread, and possibly eating it at home as well, and also plausible that the Mixtec people refused to cooperate. This would have been a deliberate act of resistance, as defined by Hodder 1984; Brown 1996; Given 2004; Beck et al. 2010; Deagan 2010.

Unfortunately, we do not know if Spanish friars tried to encourage Mixtecs to eat wheat in Achiutla. The presence of a wheat bread oven next to the convent in Achiutla tends to confirm the presence of wheat in the village (Forde 2012:45-46). Combined with the writings of the friar Burgoa (Burgoa 1934 [1676]:352), who mentions the presence of wheat in the fields of Achiutla, it is plausible that Mixtecs did grow wheat in Achiutla to a certain extent, but that does not mean they were eating it, as they could have paid tribute and sold the remaining plants to foreign markets. Without a push from Spanish authorities, it is unlikely Mixtecs decided on their own to grow wheat in order to replace maize. First, maize had played a central role in Mixtec foodways for centuries. It played a role in wedding ceremonies, feasts during the harvest season, etc. (Monaghan 1996:183–184). Maize was critically important in daily and ritual life, and still is today (Monaghan 1996:183–191). Replacing maize with a new plant with no similar importance in their own culture would be unlikely, especially with the fact that, for one grain sown, wheat produced 14 times less grains than maize (Braudel 1967:123). Wheat could have replaced maize if the maize harvests proved to be poor, but to my knowledge, there is no historical text mentioning a similar issue in the *Mixteca Alta* during the Colonial Period.

In fact, Burgoa described Achiutla as "having the best climate of all the Mixteca nation", (Burgoa 1934:348–349, translated by myself) with fertile soils where plants grew "in abundance" (Burgoa 1934:352, translated by myself). Without cultural or productive benefits, wheat did not seem to provide an interesting alternative to maize.

Second, as Achiutla was positioned at the outposts of New Spain, the Spanish authority was less established than in other parts of the *Mixteca*. At Yucundaa, Mixtec commoners had to produce wheat in order to pay tribute to the *encomenderos*. Located closer to the colonial centres, it was easier for the Spanish authorities to monitor agricultural activities at Yucundaa and ensure that commoners harvested wheat in order to pay colonial tithes. Is it possible that, with the weak Spanish authority in the region, the *encomenderos* decided to ask for something else in tribute? Historical texts show that silk production quickly became a bit more lucrative at Achiutla, compared to other places where silk worms died or produce very little amounts of silk (Forde 2015). Is it possible that the *encomenderos* decided to focus on the production of silk worms and decided to downplay the production of wheat?

It is also possible that Mixtecs of Achiutla did not eat the wheat that was produced there. As Warinner and her team found at Yucundaa, historical texts mention the production of wheat for tribute, but isotopic analysis demonstrates that Mixtecs living at Yucundaa did not eat wheat, or only in very small quantities. If Achiutla's people did produce wheat, it might have all been sent to the colonial centres and to the *encomenderos*. Unfortunately, without access to the exhaustive list of tribute granted to the *encomendor* of Achiutla, this idea will remain hypothetical.

Raising wheat might also have been a way to trick the friars and the Spanish authorities into thinking Mixtec commoners were consuming it. As mentioned before, the concept of hidden transcript (Scott 1990) consists of conveying a message publically that will generally please the authorities, while hiding in it a second meaning linked with resistance. It is possible that commoners grew wheat in order to pay tribute and sell the remaining plants, but also as a way to show that they adopted this food item to people who would monitor general activities without examining the household activities. Without eating it, they might have been able to make Spaniards believe they did eat wheat, which seemed to be one of the goals of the friars (Earle 2012:159).

Another idea would be that, being of the noble class, the occupants of both terraces received tribute from commoners. If they did not want wheat, they might have decided to receive other plants as tribute, maintaining access to maize and the traditional Mixtec foodways. As they regulated access to other prestigious resources, such as white-tailed deer, rabbit, cacao, and cotton (Spores 1967:6–8; Cook and Borah 1968:10; Houston 1983:218), it is possible that they decided to consider maize worthy to be consumed, and wheat a plant reserved to the commoners.

Final thoughts

Historical texts tend to mention that noble and the Mixtec ruling class often ate Spanish food items in order to obtain more respect from Spaniards and take on more of a European identity (Alves 1994:68). So far, this research has demonstrated that the nobles of San Miguel Achiutla kept their traditional foodways and did not include European plants in their diet. With the absence of any mention of wheat harvests at Achiutla, and the absence of any European edible plants, I believe that the people of Achiutla kept their traditional foodways intact during the upheaval of the early Colonial period. More research could test this idea and provide an understanding of the motivations behind this strong continuity.

In order to fully understand what happened at Achiutla, what happened with the harvested wheat, and if other plants, such as olives and peaches made their way there, I would recommend other excavations at the *Pueblo Viejo*. I would target terraces occupied by commoners as well as additional terraces occupied by elite members. Directing the research in this way would provide an opportunity to compare foodways between different hierarchical classes.

Did people of all classes at Achiutla, have access to introduced European plants? Were Mixtec people at Achiutla encouraged to cultivate European food plants, or include European plants into their daily lives? The paleoethnobotanical data only provides hints to answering these questions.

My goal was to assess how the Mixtecs of Achiutla negotiated the arrival of the Spanish Colonial authorities in their daily lives by examining their foodways. While their economic, political, and religious systems were being transformed by the Spaniards, the information about Achiutla's peoples' everyday lives was very limited. By looking at what plant foods they ate, I wanted to determine to what extent they resisted, negotiated, or accepted Spanish cultural elements into their own diet. I did not find any edible introduced plant species in the 27 paleoethnobotanical samples analyzed. Without any hint towards the inclusion of new food items in their diet, I believe it is likely they kept the same foodways as their ancestors from the Postclassic. This tends to demonstrate they did not accept new foods, but with the absence of historical or oral sources, I must admit I am not able to understand the full dynamics in place at Achiutla during the Early Colonial Period in order to determine if the Mixtecs resisted or not the arrival of new food items in the region. While the Mixtec culture was transformed to an extent during the Early Colonial Period, a short time period allowing us to study hybridity, it seems that the Mixtec foodways at Achiutla remained the same, providing them with a stable cultural base to hold on to.

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